

THE WEST AFRICAN EXAMINATIONS COUNCIL
BANJUL, THE GAMBIA



THE WEST AFRICAN SENIOR SCHOOL CERTIFICATE
EXAMINATION (WASSCE)

FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS'
REPORTS



THE GAMBIA

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WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS FOR THE GAMBIA

1. STANDARD OF THE PAPERS

All the Chief Examiners reported that the standard of the papers of the various subjects was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years.

2. CANDIDATES' PERFORMANCE

Candidates' performance was reported on as follows in the different subject groups:

(1) LANGUAGES

The Chief Examiner for Literature-in-English 2 reported that candidates' performance was good this year and that of Literature-in-English 3 stated that candidates' performance was fair. However, the Chief Examiners for English, French stated that there was no remarkable improvement this year while that of Arabic was silent on the issue.

(2) GENERAL SUBJECTS

The Chief Examiners for Geography 2 and 3 reported that the general performance of candidates was average. However, the Chief Examiners for Economics 2, Government 2, History 2, Islamic Religious Studies 2 and in Christian and Religious Studies reported that candidates' performance was poor compared to the previous years.

(3) MATHEMATICS SUBJECTS

The Chief Examiners for Mathematics core and Further Mathematics reported a slight improvement on candidates' performance compared to the previous year.

(4) SCIENCES

The Chief Examiners for Health Science 2, Physical Education 3 (Performance Test) and in Physics 3 (Practical Alternative A) reported that candidates' performance was good. The Chief Examiner for Chemistry 3 (Practical Alternative B) reported that candidates' performance was satisfactory while the Chief Examiners for Agricultural Science 2, Agricultural Science 3 (Practical), Biology 2, Biology 3 (Practical), Chemistry 2, Chemistry 3 (Practical Alternative A, Health Science 3, Science 2 and Science 3 reported that candidates' performance was poor.

(5) **COMMERCIAL SUBJECTS**

The Chief Examiner for Business Management reported a significant improvement on candidates' overall performance compared to the previous years. However, Candidates' performance was reported to drop in Commerce, Financial Accounting and Principles of Cost Accounting compared to last year's.

(6) **HOME SCIENCES**

The Chief Examiners for Home Sciences reported that candidates' overall performance was satisfactory in Clothing and Textiles 3 (Practical) and Foods and Nutrition 2 and 3 compared to the previous year. However, the performance of the candidates in Home Management 2 and 3, Clothing and Textiles 2 was reported to be poor.

(7) **TECHNICAL SUBJECTS**

The Chief Examiners for Metalwork 3, Visual Art 3 B, Visual Art 3 C, Auto Mechanics 3, Applied Electricity 3 and Woodwork 3 reported that candidates' performance was impressive. The Chief Examiner for Visual Art 3 A reported that candidates' performance declined slightly compared to last year's. However, the Chief Examiners for Technical Drawing 2, Technical Drawing 3, Visual Art 2, Applied Electricity 2 and Woodwork 2 reported that candidates' performance was poor compared to the previous years.

3. **CANDIDATES' STRENGTHS**

The Chief Examiners of the different subject groups highlighted few points as candidates' strengths.

(1) **LANGUAGES**

The Chief Examiner for English Language reported that candidates did well in question 4. The Chief Examiner for French stated that candidates performed better in letter writing compared to essay writing and that 98% of the candidates followed the instructions. The Chief Examiner for Literature in- English 2 & 3 reported that most candidates showed that they had read the prescribed texts. The Chief Examiner for Arabic did not see any strength worthy of mentioning.

(2) **GENERAL SUBJECTS**

The Chief Examiner for Economics 2 reported that candidates did well in questions 1 (a), 2, 3 and 4. The Chief Examiner for Geography 2 reported that the candidates did well in questions 2, 3 4 and 8. The Chief Examiner for Geography 3 stated that some candidates understood the given topic. The Chief Examiner for Government reported that most of the candidates followed the instructions and did extremely well in questions 1, 2, 6, 8 and 10. They presented correct and legible work as well. The Chief Examiner for History reported candidates' strengths on sections A and C. The Chief Examiner for Islamic Religious Studies highlighted candidates' strengths on questions 2 and 5. As for the Chief Examiner for Christian and Religious Studies, he reported that candidates' strengths were found in sections A and B that dealt with the Old Testament and the Gospel.

(3) MATHEMATICS SUBJECTS

The Chief Examiners for Mathematics reported candidates' strengths as follows:

- Ability to use vein diagram to form equation.
- Ability to clear denominations and open brackets.
- Ability to work out logarithmic functions, inverse functions and polynomials.

(4) THE SCIENCES

The Chief Examiners for the Sciences reported candidates' strengths as follows:

- Ability to present work in tabular form.
- Ability to calculate through logical steps.
- Ability to recall definitions of terminologies.
- Ability to present correct and legible work.
- Ability to follow the rubrics of the papers.
- Ability to draw and plot graphs in the practical papers.

(5) COMMERCIAL SUBJECTS

The Chief examiners for Commercial Subjects did not say much about candidates' strengths apart from the following:

- Ability to present correct and legible work.
- Ability to interpret the questions.
- Ability to recall definitions of terminologies.

(6) HOME SCIENCES

The Chief Examiners for Home Management was almost silent on candidates' strengths. However, the Chief Examiners Clothing and Textiles. Foods and Nutrition reported candidates' strengths as follows:

- Candidates were able to interpret the questions properly.
- Candidates were able to improvise a solution (using the needle) wherever the sewing machine had a problem.
- Candidates were able to attach the bias binding.
- Candidates were able to make use of the sewing machine.
- Candidates were able to answer four questions out of the six.
- Candidates were able to list the uses of legumes in the diet.
- Candidates were able to identify some of the cooking utensils in the diagram.
- Candidates were able to list examples of dishes made from legumes using their local names.
- Candidates were able to finish on time.
- Proper serving dishes were used, and dainty portions were served.

(7) TECHNICAL SUBJECTS

The Chief examiners for Technical Subjects reported candidates' strengths as follows:

- Ability to finish work on time.
- Ability to produce good work and to select correct tools.
- Ability to produce good quality line work and to demonstrate good knowledge in freehand pictorial sketch.
- Ability to use correct scale and the required dimension.
- Ability to follow the instructions.

4. CANDIDATES' WEAKNESSES

The Chief Examiners of the different subject groupings gave many reasons for the poor performance of candidates as listed below:

(1) LANGUAGES

The Chief Examiners for Languages reported candidates' weaknesses as follows:

- Misinterpretation of questions.
- Re-adaptation of material from the question paper. (Arabic & French)
- Inability to follow the instructions for some candidates.
- Inability to identify relevant evidences from the texts. (Literature-in-English 3)
- Weak vocabulary and grammatical background.
- Spelling and structural errors.

(2) GENERAL SUBJECTS

Candidates' weaknesses were reported as follows:

- Poor command of the English Language.
- Misinterpretation of questions.
- Poor presentation of work.
- Inability to draw simple and accurate diagrams.
- Inability to follow instructions for most papers.
- Lack of in-depth knowledge of the selected Epistles.

(3) MATHEMATICS SUBJECTS

Candidates' weaknesses were reported as follows:

- Misinterpretation of questions.
- Inability to translate word problems to numerical expressions.
- Inability to solve trigonometric equations.
- Inability to cover the syllabuses.

(4) SCIENCES

Candidates' weaknesses were reported as follows:

- Inability to follow the instructions.
- Inadequate coverage of the syllabus.
- Misinterpretation of questions.
- Poor presentation of work.
- Lack of in-depth knowledge of the topics covered.
- Inability to differentiate key words like -state, explain, list and define.
- Wrong spelling of scientific terms.
- Poor understanding of practical concepts and terminologies.

(5) COMMERCIAL SUBJECTS

Candidates' weaknesses were reported as follows:

- Inadequate coverage of the syllabus.
- Ill-preparation for the examination.
- Poor command of the English Language.
- Inability to follow the instructions.
- Misinterpretation of questions.
- Inability to differentiate key words like -state, explain, list and define.
- Poor understanding of technical terminologies.
- Poor presentation of work.

(6) HOME SCIENCES

The following points were reported by the Chief Examiners of the Home Sciences as weaknesses:

- Incomplete coverage of the syllabus for some candidates.
- Misinterpretation of questions.
- Inability to differentiate key words like - state, explain, enumerate/list etc.
- Poor command of the English Language.
- Lack of multi-tasking.
- Lack of practical skills in most of the activities.
- Candidates were unable to illustrate their answers using diagrams.
- The use of wrong terminology.
- Inability to do the embroidery.
- Casting stitch and making of the work loop were a problem for some candidates.

(7) TECHNICAL SUBJECTS

The various weaknesses reported by the Chief Examiners of the Technical Subjects were as follows:

- Inability to cover the syllabuses.
- Inability to follow the instructions.
- Inability to label and put the required features.
- Lack of knowledge of the properties of some metals.
- Poor line work and wrong dimensioning.
- Inability to use some tools for some candidates.
- Poor visualisation skill.
- Lack of knowledge in Geometry drawing.
- Lack of knowledge in the three-speed sliding mesh gearbox and inability to calculate gear ratio.
- Inability to understand key words like - state, explain, list, etc.
- Poor coloured patterns.
- Lack of safety gear in the workshops.
- Poor command of the English Language.
- Lack of knowledge of machine work.

If

5. SUGGESTED REMEDIES

The Chief Examiners of the different subject groups proposed the following measures as way of improving on performance:

(1) LANGUAGES

- Candidates should take time to read extensively, write often and improve on their spelling, vocabulary and tenses.
- Candidates should expose themselves to French media. (French)
- Candidates should be encouraged to read qualitatively and understand questions before answering. (Literature-in-English 2)
- Candidates should study prescribed texts instead of just reading them. (Lit-in-English 3)
- Candidates should make use of the Chief Examiners' reports and past

(2) GENERAL SUBJECTS

- Candidates and Teachers should endeavour to cover the syllabus.
- Candidates should take time to read and understand the given instructions.
- Candidates should be adequately prepared for the examination.
- Candidates should make use of the past papers.
- Regular monitoring of teaching and learning should be done in schools.
- Candidates should read extensively to improve their English.
- Candidates should learn how to draw and label diagrams, maps, etc. clearly and accurately.
- Qualified teachers should be employed to teach the subject.
- Parents should discourage their children from watching a lot of television at home.
- Candidates and teachers should make use of the prescribed text books and not to depend entirely on pamphlets written by other teachers.
- Candidates and teachers should encourage students to do more research into their subject matter.

(3) MATHEMATICS SUBJECTS

- Candidates and teachers should endeavour to cover the syllabus.
- Candidates should be adequately prepared for the examination.
- Students should be encouraged to read and understand examination's instructions before answering questions.
- Candidates should study mathematical concepts very well and retain them.
- Candidates should familiar themselves with the use of mathematical instruments (Graph, calculators, compass, etc.).

(4) THE SCIENCES

- Candidates should endeavour to complete the syllabus.
- Candidates should make use of past question papers.
- Candidates should take time to read and understand the instructions.
- Additional emphasis should be put on problem solving exercise.
- Candidates should be exposed to practical work under necessary precautions
- Teachers should put emphasis on key/technical words like, state, list, explain, enumerate, etc.

(5) COMMERCIAL SUBJECTS

- Candidates should endeavour to complete the syllabus.
- Students should be encouraged to read and understand examination's instructions before answering questions.
- Candidates should make use of prescribed text books.
- Candidates should read extensively and write to improve on the use of the English Language.
- Teachers should give regular assessments to have a feedback on each topic taught.
- Candidates and teachers should make use of the Chief Examiners' reports and past question papers.

(6) HOME SCIENCES

- Candidates should endeavour to cover the syllabus before the examination.
- Teachers should have in-service training course for Home Sciences.
- Candidates should read extensively and make use of the internet, supplementary books or journals.
- Principals should support the teachers by providing a well-equipped lab and needed materials for course work..
- All centres must prepare and cook inside for hygienic reasons.
- Candidates should be exposed to more practical works.
- School administration should employ qualified teachers.
- School candidates should make effective use of both the WASSCE Home Management teaching and examination syllabuses before the examination period to acquaint themselves with necessary.
- Candidates and teachers should make use of Chief Examiners' reports and past question papers.
- Candidates should familiarize themselves with key words like list, enumerate, state, explain, illustrate, describe etc.
- Candidates should attend regular Home Management lessons before registering for the exams.
- Home management subject teachers should conduct practical lessons at schools in accordance with the syllabus only.
- Teachers should administer not only summative assessment but also internal practical assessment to enable candidates acquire necessary skills.
- Schools should provide remedial classes to assist and motivate weak candidates.
- School Administration should encourage the teaching of Clothing and Textiles from Grade 7.

(7) TECHNICAL SUBJECTS

- Candidates should be adequately prepared for the examination.
- Candidates should be exposed to more practical lessons.
- Teachers should endeavour to cover the syllabus.
- Teachers should put emphasis on marking out, filing and drilling exercise.
- Teachers should put more emphasis on the teaching of design and drawing.
- Teachers should use teaching aids in order to shape the visualisation strength of candidates.
- Art teachers should focus more attention on the teaching of colour and correct shading techniques.
- Schools should provide conducive environments for practical subjects and needed materials for course work.

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
THE LANGUAGES

1. STANDARD OF THE PAPERS

All the Chief Examiners in the Languages section indicated that the papers were within WAEC Standard.

2. CANDIDATES' PERFORMANCE

The Chief Examiner for Literature-in-English 2 reported that candidates' performance was good this year and that of Literature-in-English 3 stated that candidates's performance was fair. However, the Chief Examiners for English, French stated that there was no remarkable improvement this year while that of Arabic was silent on the issue.

3. CANDIDATES' STRENGTHS

The Chief Examiner for English indicated that 70% of candidates who attempted Question 4 performed appreciably while the Chief Examiner for French stated that 98% of the candidates answered the questions appropriately. He further stated that candidates did better in Letter writing than Essay

The Chief Examiner for Literature-in-English 2 revealed that candidates presented their answer well and that they showed understanding of the texts while that of Literature-in-English 3 highlighted that candidates showed evidence of reading the texts.

However, the Chief Examiner for Arabic did not see any strength worthy of mention.

4. CANDIDATES' WEAKNESSES

The Chief Examiner for English revealed that a good number of candidates misinterpreted the questions and that there were numerous spelling errors and grammatical mistakes while that of Arabic stated that many candidates did not adhere to the instructions while some just copied the questions as answers.

The Chief Examiner for French highlighted that most candidates showed weaknesses in vocabulary, spelling, grammar and structural errors. The Chief Examiners for Literature-in-English 2 and 3 stated that candidates misinterpreted the questions and exhibited deficiencies in spelling, grammar and subject verb agreement.

5. SUGGESTED REMEDIES

The Chief Examiners proposed the following suggestions to improve on candidates' performance:

- Candidates should read extensively (Arabic).
- Candidates should study prescribed texts instead of just reading them (Literature-in-English 3).
- Candidates should cultivate the culture of speaking, reading and writing in French.
- Candidates should be encouraged to read qualitatively and understand questions before answering (Literature-in-English 2).
- Candidates should read extensively, write often and improve on their spelling, vocabulary and tenses. (English)

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS' REPORT
ARABIC 2

1. GENERAL COMMENTS

The Chief Examiner reported that the standard of the paper was appropriate, within the scope of the syllabus and ears the expected ability of candidates. Nevertheless, Prose and Poem questions are not easy at all, considering the fact that candidates' mother tongue is not Arabic. The number of candidates declined due to many reasons for example, lack of text books, suitable libraries where Arabic text books could be found.

2. CANDIDATES' STRENGTHS

The Chief Examiner for Arabic did not see any strength worthy of mentioning. The majority of candidates just copied the questions verbatim without any explanation.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- The majority of the candidates misinterpreted the questions.
- Inability to write the required number of words (at least 120 words) in part one.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Students should be encouraged to read widely and write often to improve on their spelling, vocabulary and tenses.
- Candidates should make use of the Chief Examiners' reports and past papers.

5. DETAILED COMMENT ON INDIVIDUAL QUESTIONS

Question one part one:

ESSAY

أَجِبْ عَنْ سُؤَالٍ وَاحِدٍ مِنَ الْقِسْمِ الْأَوَّلِ وَأَرْبَعَةَ أَسْئَلَةٍ مِنَ الْقِسْمِ الثَّانِي،
وَيَجِبُ أَنْ تُكَوِّنَ أَجُوبَتَكَ بِالْعَرَبِيَّةِ.

*Answer **one** question in part I and **four** questions in part II*
*Your answer **must** be written in Arabic*

الْقِسْمُ الْأَوَّلُ : الْإِلْثَاءُ

اُكْتُبْ حَوَالِي مِائَةٍ وَعِشْرِينَ كَلِمَةً عَنْ وَاحِدٍ مِنَ الْمَوْضُوعَاتِ الْآتِيَةِ.

Write a composition of about **120** words on **any** of the following topics.

- ١ - آفَاتُ إِهْمَالِ الْأَمَانَةِ فِي الْمَجْتَمَعِ
- ٢ - يَوْمٌ لَا أَنْسَاهُ
- ٣ - فَوَائِدُ الْهَاتِفِ
- ٤ - رِسَالَةٌ إِلَى أَبِيكَ تُخَيِّرُهُ فِيهَا عَنْ شَخْصٍ أَعَانَكَ فِي الْمَدْرَسَةِ

Question 1

This particular question was not very popular among the candidates. The meaning of the question was: non fulfilment of pledges. The expected answers should read as follows:

- Introduction
- The meaning of pledge
- Danger of non-fulfilment of pledges
- Quotation from Quran and Hadith

Question 2

A day I shall never forget

The expected answers should read as follows:

- Introduction
- The reason why one should not forget an important day to him/her
- Story of an occasion that will continue to linger in once memory
- Quotation from the Holy Quran and Hadith
- Good conclusion

Question 3

The benefit of telephone

The expected answers should read as follows:

- Introduction
- The meaning of telephone
- Type of telephone
- Good conclusion

Question 4

A letter to your father informing him about a person who assisted you in school.

The expected answers should read as follows:

- Introduction
- Date

- Reason for writing the letter
- Description of assistance given to you in the school
- Good conclusion including best wishes and greetings to members of the family
- Yours sincerely son/daughter

الْقِسْمُ الثَّانِي: الْأَدَبُ

PART 2 LITERATURE

أَجِبْ عَنِ السُّؤَالِ الْأَوَّلِ وَثَلَاثَةِ أَسْئَلَةٍ أُخْرَى مِنْ الْأَسْئَلَةِ الْآتِيَةِ.

Answer question one and any other three from the following questions.

١ - اشرح الآيات الآتية شرحاً واضحاً.

بَانَ سَعَادُ فَقَلْبِي الْيَوْمَ مَنبُولٌ # مُتَيْمٌ عِنْدَهَا لَمْ يُجْزَ مَكْبُولٌ
وَمَا سَعَادُ غَدَاةَ الْبَيْنِ إِذْ بَرَزَتْ # إِلَّا أَعْنُ غَضِيضِ الظَّرْفِ مَكْحُولٌ
تَجْلُو عَوَارِضَ ذِي ظُلُمٍ إِذَا ابْتَسَمَتْ # كَأَنَّهُ مُنْهَلٌ بِالرَّاحِ مَغْلُولٌ
[كَفَبُ بْنُ زُهَيْرٍ]

٢ - عَرِّفِ الثَّلَاثَةَ مِنَ الشَّخْصِيَّاتِ الْآتِيَةِ كَمَا وَرَدَ فِي كِتَابِ

"الطَّبَقَةُ الْعُلْيَا" لِلْأَسْتَاذِ الدُّكْتُورِ زَكْرِيَاءُ أ. حُسَيْنٍ:

أ- مَا لَمْ عَبْدُ الْمُعِزِّ بْنِ غُومِنَا

ب- الْأَمِيرُ عَبْدُ الْمُقْسِطِ فِتْنَانَا

ج- فُودِينَابَا أَكَابَا

د- الْعَرِيفُ عَبْدُ الْهَادِي

هـ- السَّيِّدَةُ أَدِينُوسَا

٣ - اُكْتُبْ بِإِيجَازٍ عَنْ تَرْجَمَةِ حَيَاةِ عَدِيِّ ابْنِ زَيْدٍ وَمَثَلِ بَيْتَيْنِ

مِنْ أَشْعَارِهِ فِي "نَظَرَةٍ فِي الْحَيَاةِ"

٤ - تَكَلِّمْ بِإِيجَازٍ عَنِ عَصْرِ التَّجْدِيدِ عَلَى صَوِّ الْجَوَابِ الْآتِيَةِ:

أ- الْجَانِبُ الْاجْتِمَاعِيُّ ب- الْجَانِبُ الدِّينِيُّ ج- الْجَانِبُ السِّيَاسِيُّ

• اُكْتُبْ عَنْ حَيَاةِ زُهَيْرِ بْنِ أَبِي سُلَيْمٍ، وَمَثَلِ بَيْتٍ وَاحِدٍ

مِنْ مَذْهَبِ لِهَرَمِ ابْنِ سِنَانٍ.

PART 2 LITERATURE

Question 1

Explain the following poems

The expected answers should read as follows:

- The poet Kab B. Zahir described his sadness for departure of his sweet heart
- The poet described his lover as a lady who is not very short and not tall and her voice contain nice melody
- The poet described the beauty of his sweet heart specially when she smiles

Question 2

Give brief history of the following persons as it was mentioned in Doctor Zakariyya Husayn's book

a. Malam Abdul Amuiz B. Ghumina

The expected answers should read as follows:

- He was imam of Funori City
- He was a teacher of the Holy Quran
- He was an interpreter of the Holy Quran

b. Alamir Abdul Muqist Fina Fina

The expected answer should read as follows:

- He was nominated member of throne of Funori City after the death of King Alhagie Abdul Aziz

c. Foday Baba Akaba

The expected answer should read as follows:

- He was a president of businessmen in Funori City

d. Al Arif Abdul Hadi

The expected answer should read as follows:

- He was a president of student union

e. Saidatu Adysu

The expected answers should read as follows:

- She was a wife of Malam Abdul Muiz
- She was a Quranic teacher of children in the low schools

Question 3

Write brief life history of Ady B. Zayd and give two examples of his poem

The expected answers should read as follows:

- Ady B. Zayd was a jahiliya period poet.
- His nicknames were Aby Umari and Aby Sawadat.
- He was a Christian.
- He speaks Pasian language.

Question 4

Write about renaissance on the side line of the following:

- a. Social*
- b. Religious*
- c. Political*

The expected answers should read as follows:

- Introduction;
- Study of the environment, culture and literature and life history of scholars;
- Contribution of scholars in their writings indicates that in habitants of Northern Nigeria were Hausa, Fulani, Barbari, Tawarq besides Arabs who came to the region for commerce.

- a. Social*

The expected answer should read as follows:

- History of that era indicates that tribes who live in Northern Nigeria especially Bruno, Hausa, Fulani, Barbar, Tawarq, live side by side with Arab tribes that have come for commerce.

- b. Religious*

The expected answers should read as follows:

Islam was introduced early in Hausa land and Borno as a result Islam became dominant religion in the area. Despite the spread of Islam, there has been three categories of Muslims:

- Group one of Muslims practised their Islam in accordance with the teaching of the Quran and Sunnah.
- Group two of Muslims practised some cultural practices that are not in line with Islamic teaching.
- Group three of Muslims followed their cultural religious practices.

- c. Political*

The expected answers should read as follows:

- During the time Sheikh Ousman Dan Fodio, Northern Nigeria was not under one political system

- Hausa land consists of different independent emirates, many a time these emirates were engaged in war
- Good conclusion

Question 5

Write life history of Zuhar B. Abizulma and give one example of his poems.

The expected answers should read as follows:

- He was born in Arabian peninsula and he was very close to his rich uncle Basha who was renown poet and has no son
- He learnt a lot from his uncle. He later became a great poet he was one of three renown poet of Aljahiliya period
- He believed in resurrection and urged people to behave well though he was jahiliya period poet

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
ENGLISH LANGUAGE

1. GENERAL COMMENTS

The paper was of the WAEC standard. The questions were well printed. They were within the scope of candidates.

2. CANDIDATES' STRENGTH

In section A, candidates prepared performed appreciably well in Question 4. 70% of those who attempted the question did justice to it. In section B, 60% of candidates got answer right in Question 6 g i and ii.

3. CANDIDATES' WEAKNESSES

In Section A about 40% of the candidates grossly misinterpreted the question. Instead of writing on two problems affecting their country, they wrote on "The problems facing my country," or "The major problems facing my country."

In addition to the above mentioned weaknesses, candidates exhibited the following:

- Repetition of mistakes which the Chief Examiner had corrected in his previous reports- mistakes like "for that being the case," and "I wish this letter will meet you in a good condition of health."
- "Pallow" for "palour".
- "Eating room" for "dinning room".
- "sleeping room" for "bed room".
- "Birth-room" for "bath room".
- "Chicken" for "kitchen".

4. SUGGESTED REMEDIES

The chief Examiner proposed the following suggestions:

- Candidates should be drilled in spelling and grammar.
- Schools should encourage weekly or monthly Easy writing competition to enable students get used to reading and writing effectively.
- There should be periodic seminars or workshops at the regional or cluster level to ensure that teachers of English exchange methods and approaches of best practice.
- Teachers should read recommendations of Chief Examiners and act on them.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

Your father has just built a new house for the family. Write a letter to your elder brother who lives abroad describing the new house and the prestige it has accorded your family.

The candidate is required to write a letter to his/her elder brother who lives abroad, describing the new family house and the prestige it has accorded his/her family. This question was attempted by 80% of the candidates. The following observations were made:

- 30% of the candidates could not write the formal features of this letter correctly.
- 60% of the candidates dwelt on the description of the house and either ignored the second part or treated it inadequately.
- 30% of the candidates rambled a lot or made useless repetition of ideas.
- 10% of the candidates could not state the right names of the rooms in the house and therefore wrote:
 - Pallow for parlour;
 - Chicken for kitchen;
 - Cooking room for kitchen;
 - Eating room for dining room;
 - They called the house a story building instead of storey building;
- 20% of the candidates rambled and made useless repetition of ideas.

Question 2

Write an article suitable for publication in a national newspaper, discussing two major problems facing your country and suggesting ways of solving them.

The candidate is required to write an article suitable for publication in a national newspaper discussing two major problems facing his/her country and suggesting ways of solving them.

It was the most unpopular question. Only 2% of the candidates attempted it. The majority of those who attempted this question wrote letters instead of Articles. Those who wrote Articles could not write the formal features of the article correctly. Some created their own topics e.g. 'Problems facing my country' and 'Major problems facing my country'. Having thus strayed from the question set, they could not treat the set question well.

Question 3

The electricity supply in your school has been irregular. As the Seior Prefect, write a letter to the Chairman of the Parent Teacher Association (PTA) telling him about the effect on the school and the need to provide a stand-by generator for the school.

The candidate is required to write a letter to the Chairman of the Parent-Teacher Association (PTA) telling him about the effect of the irregular electricity supply has on the school and the need to provide a stand-by generator for the school.

Candidates wrote the formal features of this letter correctly. 50% of those who attempted it did not treat the two aspects of this question i.e. the shortage of power supply in the school and the request for a stand-by generator. Indeed this was the most poorly done question.

Question 4

Your Principal is due for retirement at the end of the academic year. As the Senior Prefect, write a speech which you could deliver to honour him/her at a send-off party.

The candidate is required to write a speech he/she would deliver on the occasion of a send-off party in honour of his/her principal who will be going on retirement. This question was attempted by 30% of the candidates. Candidates performed appreciably well. 70% of those who attempted this question were able to praise the principal that was to retire, mention his achievements and how he brought improvement to the school.

Question 5

Write a story ending with the expression: At least we arrived safely.

The candidate is required to write a story ending with the expression: at last, we arrived safely. This question was the next popular question. It was attempted by 10% of the candidates. 50% of those who attempted this question wrote good stories. The rest either wrote some bad stories and stuck the expression at the end or wrote unstructured stories.]

SECTION B COMPREHENSION

Question 6

*Read the following passage **carefully** and answer the questions on it.*

When I was in primary four, thirty-five years ago, schools closed for the day at 1.30p.m. My two friends and I would then proceed for 'full' recreation as we either played football in hidden neighbourhoods or went downstream to swim till dusk. The reprimands and occasional spankings we got from our mothers could not deter us. Our youthful adventurous spirit would not be suppressed. We were resolute in our desire to be free of what we thought were too many chores. As far as we were concerned, that should be the preserve of the female gender.

One day we went fishing in a stream on the outskirts of the village after we had had our fill of entertainment playing football. We each caught some fish but were not satisfied; we wanted crabs which we could sell on our way back home to augment the meagre 'money for recess' that each of us got when going off to school everyday. We caught two big crabs from the first two holes we dug before going for a third. Convinced that we had dug deep enough, the eldest of us dipped his right hand into the hole that was about three-quarters filled with water, and soon reported excitedly that he had made a big catch. As he dragged it to the surface we screamed in sudden terror. The 'big catch' was the fleshly middle part of a shimmering black snake! No one waited for the other as was scrambled for safety, leaving our other catch behind. The boy splashed frantically through the water, falling over twice before reaching us on the bank of the stream. None of us ventured back, more for fear of the snake than the dusk that had 'suddenly' descended on the village.

When I got home, I met Mother, my two siblings and some anxious relations at the doorstep. They were about setting out to comb the entire village since their previous search to my school, my mates' homes and the few playgrounds in the village had been

futile. The concerned look on Mother's face told me I had stirred up a hornets' nest and should be prepared for the sting. My muddy legs and hands betrayed the lie I had hurriedly cooked up. I got the beating of my life, first from Mother and then Father, who came into the house and upon being told what had happened, went straight for the thick rubber he had wound around his bicycle carrier for tying loads.

- (a) State **two** reasons why the writer and his friends always come home late.
- (b) Why did the boys get home late on that fateful day?
- (c) Why did the boys **not** realize that it was getting dark?
- (d) In what **two** ways was the writer unlucky on that day?
- (e) How does the writer's mother usually demonstrate her disapproval of his behaviour?
- (f) "... I had stirred up a hornets' nest and should be prepared for the sting".
 - (i) What figure of speech is used in this expression?
 - (ii) What does it mean?
- (g) "As he dragged it to the surface..."
 - (i) What grammatical name is given to this expression as it is used in the passage?
 - (ii) What is its function?
- (h) For **each** of the following words, find another word or phrase which means the same and which can replace it as it is used in the passage:
 - (i) *deter*;
 - (ii) *preserve*;
 - (iii) *augment*;
 - (iv) *ventured*;
 - (v) *concerned*.

30% of the candidates who answered the (a) part of this question copied parts of the comprehension passage for their answers.

The (b) part was badly done. Candidates wrote:

- They played football.
- They went downstream to swim.
- They split the two components of this question which should gain only one mark, hoping to score two marks.

Part (c) of this question was well answered.

The answer for the (d) part of this question was not done exhaustively by 60% of the candidates. For example, they wrote only

- They went fishing.
- They went looking for crabs.
- They went to swim.

The (e) part of this question was well answered.

40% of the candidates who answered the (f) part of this question could identify the figure of speech as a metaphor but spoilt their answer by spelling 'metaphor' wrongly.

70% of the candidates who answered the (g) part of this question could not give the correct meaning of the expression.

60% of the candidates got the answers for (g) (i) and (g) (ii) correct

Part (h) of this question was the most poorly answered one. Only 20% of the candidates could give the correct substitutes for the words.

SECTION C

SUMMARY

Question 7

Read the following passage **carefully** and answer the questions on it.

Young people are usually faced with several challenges as they grow up. These challenges have increased dramatically as a result of the present impressive advances in science. The Internet and the mobile phone, for instance, have indeed reduced the whole world to a global village and give birth to social media. Social media itself has made it possible for anyone to instantly keep abreast with happenings all round the world.

But many people are worried that a lot of youths use social media in various negative ways that tend to ultimately increase the challenges they face in life. First, internet chatting and dating have become common among youths. They spend valuable time in internet cafes or glued to their smart phones with the hope that through Skype or Facebook “luck” would come their way. The time wasted in this way could have been spent on studying and helping their parents with household chores.

Another downside of social media is the easy access to pornography that it offers. Attached like gnats to bright light at night, many youths spend hours watching pornography. This has the inevitable effect of corrupting their minds. In the fantasy world that pornography plunges them into, they care little for anything else. In the end, the casualties are their studies and morals.

Again, youths are often driven by the “get rich quick” syndrome as they observe successful and affluent members of the society all round them who flaunt their wealth by driving expensive cars and living ostentatious lifestyles. Because many youths are seized by the irresistible desire to become like these people overnight, they readily resort to any available means to succeed, including cyber crime. Since face-to-face contact is not involved, it is easy for these misguided youths to plan and execute all manner of scams on social media.

What can be done to rescue the youths from these influences? First, parents have a crucial role to play. Many youths have improper home training and most parents have their children to learn life’s lessons on their own. They allow them to find solutions to their problems with minimal guidance. The reality is that the sooner parents change their method of raising children, the better.

Teachers also have to play a crucial role. Teachers should realize that just as parents take over the responsibility of teaching when their children are at home, they in turn become the youth’s parents at school. They should therefore ensure not only that the right skills are taught the youth, but also that the right attitudes are instilled in them.

The society at large should also realize that at their impressionable age, youths are simply influenced by what they observe happening around them, whether good or bad. So, instead of emphasizing materialism and flaunting of wealth, the society’s responsibility towards the youths should be mainly to instil in them its norms, customs and values through proper role

medelling. Then the world will become a better place for the youth, because they will be able to control their own destiny.

- (a) In three sentences, one for each, summarize the negative influence of social media on youths.*
- (b) In three sentences, one for each, summarize what must be done to rescue the youths from the se influences.*

80% of the candidates scored zero in this question. This year's summary question beat the majority of the candidates.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
FRENCH 2

1. GENERAL COMMENTS

The paper was within WAEC standard. This report is based on Section A of French 2 & 1, which required the candidates to write one essay (from questions 1-3) and one letter (from questions 4-6). A total number of 719 candidates sat this paper, representing a significant drop of 99 candidates compared with last year's 818 candidates. Approximately 98.3% of the candidates wrote one composition and one letter while about 1.7% answered just one question. It is important to note that although the number of candidates who opted for French remains significant, scores in this paper continue dropping on the average even in those private schools which were producing outstanding results in this paper for these past years. However, there is still evidence of success in the teaching and learning of French in a few private schools in the Kanifing Municipal Council. During the conduct of the French Orals, it was also observed that most of the pupils started learning French in the Senior Secondary School.

In short, there has not been any marked improvement in the overall performance of the candidates in this paper: only about 35 % of the candidates scored above 20 out of 40 marks.

2. CANDIDATES' STRENGTHS

Candidates demonstrated these two strengths:

- About 98% of the candidates understood the instructions as well as the questions and answered them appropriately.
- Candidates did better in letter writing than in the essay.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- All the candidates committed grave spelling and structural errors, in addition to their weak vocabulary.
- Whole sets of candidates from certain schools wrote ready-made pieces which they could have prepared with their teacher(s).
- The just-mentioned category of candidates, who resorted to memorizing and reproducing ready-made material, ended up writing out-of-topic.
- Candidates, especially those from challenged schools, readapted material from the paper in order to have something to write. Challenged schools in this context are schools that are either poorly staffed or admit mainly students with poor Grade 9 results, or both cases.
- Weak grammatical background.
- Weak and inappropriate use of vocabulary.
- About 1.3% of the candidates did not understand the questions.
- About 1.3% of the candidates did not obey the instructions.

It is important to note that the mistakes/errors are either slightly different from those committed by previous candidates or exactly the same. Below, in table format, is a non-exhaustive catalogue of errors detected in the scripts of the candidates, with proposed corrections against each error/mistake:

Error	Proposed Correction
... je me grand plaisir	... cela me fait un grand plaisir
... les élèves ne pas tomber malade	... les élèves ne sont pas tombés malades
je suis porté vêtements spécials pour la fête	j'ai mis des vêtements spéciaux pour la fête
se jour la	ce jour-là
moi amie, je trein contante	mon amie, je suis très contente
je suis contant/je suis contan	je suis content(e)
j'ai très content	... je suis très content(e)
ma cher père, je suis ecrit	Mon cher père, je vous écris cette lettre
mon frère sappelle	mon frère s'appelle
mon nouveau professeur de mathématiques c'est parle bien anglais et c'est sympath aussi.	mon nouveau professeur de mathématiques parle bien anglais et est sympa aussi.
mon nouveau ecole	ma nouvelle école
a la university	à l'université
il adore dancer	il aime trop danser
il respectes sont parent et aime sont frere et soeur	Il respecte ses parents et aime ses frères et sœurs
ze veut partir Dakar la vacance pour improver mon francais. C'est un langue qui j'aim	je veux partir à Dakar pendant les vacances pour améliorer mon français
au Dakar/elle habite en Dakar	Elle habite à Dakar
...au Bamako	...à Bamako
mon frere est le 18 ans	mon frère a 18 ans
elle à mariée et à dix-huit ans	Elle est mariée et a dix-huit ans
que vous Dieux protégé	Que Dieu vous protège
actuellement je suis très content	Je suis très content à présent
il ne rude pas	Il n'est pas impoli/ Il est très poli
il joue la balle	Il joue au ballon
beaucoup de vie on été perdu	beaucoup de vies ont été perdues
Beaucoup des	Beaucoup de
Je vous attend ton repond	J'attends votre réponse
sac jour	chaque jour
...chaque un	...chacun
il aide moi	il m'aide
il aime lui	il l'aime
tu le monde la ba est bien	tout le monde là-bas va bien
il encourage moi	il m'encourage
... tout le monde porte bien	... tout le monde se porte bien
Abientot	A bientôt
je vais écrit	je vais écrire
Je veux écrire à toi cet lettre	Je veux t'écrire cette lettre
je tres heureux a ecrivez le lettre	Je suis très heureux (euse) content(e) de t'écrire cette lettre
je me fait plasir	cela me fait plaisir
je t'embrace/ambrase	je t'embrasse
... elle aussi souhaite nous parlons...	... elle souhaite aussi que nous parlions...
... elle a une tein noir	... elle a un teint noir/elle est de teint noir
... marié	... marié

...il est a longtemps	... il y a longtemps
...la laboratoire	... le laboratoire
...il y a à pos-près	... il y a à peu près
... je pourquoi	... c'est pourquoi
...perse qui, pasque, passki, paskay, parsa que, pasique, par-sa-ka, etc.	... parce que
... jespere	... j'espère
... comment va tu?	Comment vas-tu?
... comment sa va?	Comment ça va?
toujour	toujours
... depi	... depuis
... il aussi donne moi	... il m'a donné aussi
... je vais très longtemps je ne pas parle avec toi	Ca fait très longtemps que je n'ai pas parlé avec toi
... jisca	... jusqu'à
Il a très calme	Il est très calm
J'ai allé	Je suis allé(e)
Je suis écrivez cette essay	J'écris cette lettre
Tout le monde aime le à l'école	Tout le monde l'aime à l'école
La lycée	Le lycée

4. **SUGGESTED REMEDIES**

The following suggestions shall help future candidates minimize making mistakes in basic French if taken seriously:

- Teachers should update themselves on the new methods of teaching French as a foreign language (The Ministry of Basic Education should organize teacher training workshops).
- Candidates should be made to do more practice in grammar.
- Candidates should be drilled systematically in both written and oral productions using current issues.
- Candidates should be taken through cognate words.
- Candidates should cultivate the practice of reading French magazines, listening to French programmes on radio and watching French programmes on television stations as well.
- Candidates should access French past papers for better guidance and preparation.
- Above all, since French has been made compulsory in certain schools, it is advisable for those schools to improve the teacher-pupil ratio for better results.
- Only students who pass French in the GABECE should be allowed to do it in the Senior Secondary School.
- Candidates who did not opt for French in the Upper basic Schools should not be permitted to start French in the Senior Secondary Schools.
- The books listed below could be of immense help to candidates; it is hoped that these books (the list is far from being perfect and exhaustive) can help minimize the errors:

1. Bérard Evelyne, Yves Canier, Christian Lavenne Gilles Breton and Christian Tagliante, *Studio 60 1&2, Studio 100*, Paris, Edition Didier, 2002.
2. Bérard Evelyne, Yves Canier and Christian Lavenne, *Tempo 1&2*, Paris, Edition Didier, 1996.
3. Bhely-Quenom O and SAM Pratt, *New Practical French 4&5*, London, Longman, 1975.
4. Brachet ML and J de Grandsaigne: *France Afrique 4*, London, Macmillan Publishers, 1988.

5. Chapman RHB, *A French Vocabulary for West Africa*, Cambridge, Cambridge University Press, 1964.
6. Penfornis, Jean-Luc, *Vocabulaire progressive du français des affaires*, Paris, CLE International, 2010.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

ESSAY

Question 1:

Faites le portrait physique et morale du directeur de votre école.

343 candidates attempted this question and about 48% of this number answered the question appropriately both in terms of content and form.

Question 2:

Selon vous, quels sont les avantages et les inconvénients du sport pour les élèves?

302 candidates attempted this question and about 52% of them answered it satisfactorily both in terms to content and form.

Question 3:

Racontez une histoire pour illustrer ce proverbe: Contentement passe richesse?

53 candidates attempted this question and none of them answered the question appropriately both in terms of content and form.

SECTION B

LETTER WRITING

Question 4:

Vous venez de passer six semaines dans votre nouvelle école. Ecrivez une lettre à votre père pour lui parler de votre expérience.

310 candidates attempted this question. Approximately 57% of this number answered this question satisfactorily both in content and style. The remaining 43% either reproduced out-of-context classroom materials or readapted materials from the question booklet in a rather confused manner.

Question 5:

Ce sera bientôt la rentrée scolaire. Écrivez une lettre à votre oncle qui se trouve en France pour lui parler de vos besoins pour la rentrée.

84 candidates attempted this question and out of this number, approximately 45% of them proved satisfactory both in content and style. The remaining 55% scored low marks and more than half of this 55% could not do more than copy down the questions contained in the question booklet or reproduce model letters they probably learned during their various training sessions.

Question 6:

Écrivez une lettre à votre professeur de français pour lui expliquer pourquoi vous ne pourrez pas aller à Dakar avec le club de français.

165 candidates attempted this question and nearly 55% of them did well both in terms of content and style; and about 45% reproduced readymade letters that are completely at variance with the question.

WASSCE SCHOOL FOR CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
LITERATURE IN-ENGLISH 2

1. GENERAL COMMENTS

The Chief Examiner reported that the standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. The performance was good. It is worth mentioning that this year's performance would have been by far better if it had not been the high frequency of misinterpretations, irrelevant narrations and too brief answers.

2. CANDIDATES' STRENGTHS

There was a noticeable improvement in performance this year. Over 80% of this year's candidates manifested some understanding of the text. About 30% of them showed clear understanding of the questions and the texts. Relevant points, proper development and adequate supporting details in the given answers showed candidates' mastering of the topic.

3. CANDIDATES' WEAKNESSES

Notwithstanding the above mentioned qualities, about 40% were matted on their answer by misinterpreting the questions, giving irrelevant narrations and very short answers. These misinterpretations were in the form of one sidedness, narrow or shallow degree or outright divergence from the question requirement.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions to improve on the performance:

- Candidates should be encouraged to read qualitatively and understand questions before answering.
- Candidates should take time to read extensively and write often.
- Candidates should make use of the Chief Examiners' reports and past papers.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

AFRICAN PROSE

*Answer **one** question **only** from this section*

Question 1

Examine the significance of Fofo's visit to Odarley in the novel.

This question was answered by about 40% and this less popular question required a brief explanation of the purpose of the visit-escape to supposed refuge. The significance should be explained in terms of the sufferings of street children like Fofo such as insecurity, improper shelter, general immorality, lawlessness etc. About 40% of these candidates treated at least half of all the relevant points to an appreciable degree of aptitude in terms of idea development and adequacy of materials. Some 30% provided one-sided shallow dimensional answers which treated one or two points shrouded in irrelevant narrations. Another 20% of these candidates

provided very short answers (ten lines or less). These were mainly brief narrations reflecting rather sketched relevant details. This question was neither nor well answered on the whole.

Question 2

Consider Baby 'T' as a victim of social injustice.

This was highly popular and far better answered question than question one. It was attempted by over 50% of the candidates. Over half of them clearly identified the relevant points such as negligence, parental, social and institutional exploitation, poverty and superstitious beliefs. Also about 40% of these candidates provided developed and adequately detailed answers. Most of the remaining candidates provided narrations with limited relevant ideas. About 20% of these answers were either irrelevant narrations or short notes with any relevant points or details on the whole. Nevertheless, this question was highly popular and fairly well answered.

Question 3

How is Ajumobi portrayed in the novel?

This question appeared controversial and tricky for many candidates. Since Ajumabi is portrayed posthumously and is seen mainly through flashbacks in yaremis's lifestyle and reflections in short, the question was rather less popular and attempted by about 30% of the candidates. About 40% of these candidates presented indirect but rather relevant points of his life such as a caring husband and father, a reputable hunter and farmer as well as a sociable villager. Such candidates earned at least a pass mark where their materials were adequate, some 30% of these candidates responded correctly and positively to the requirement of the question and earned credit. About 20% resorted to either irrelevant narrations or short notes. On the whole this question appeared demanding but candidates fairly answered it.

Question 4

Comment on the attitude of the people of Kufi towards superstition.

This question was popular and attempted by almost 60% of the candidates but it was rather poorly answered. Over 60% of these candidates restricted themselves to the Kufi attitude towards women as reflected in some of their traditions, merely arguing that the village cruelly victimized women especially widows such answers were severely one-sided, rather propagandist and shallow-dimensional a sharp deviation and limitation to the questions' requirements. Some 25% of them provided the proper requirements with adequate supporting details and earned a credit or a good mark. On the whole, this question although one of the most popular was also among the worst answered.

SECTION B

NON-AFRICAN PROSE

*Answer **one** question **only** from this section*

Question 5

Examine Mrs. Dalton's blindness as a metaphor for race relations in the novel.

This question can be easily singled out as the over 60% of the candidates attempted it. However, over half of them merely described Mary's bedroom death in Mrs. Dalton's presence without linking Mrs. Dalton's blindness with the metaphorical blindness of society towards the racial inequality e.g. Mr. Dalton's pretentious generosity to blacks, the surprisingly open and accommodating dispositions of many and Jan towards bigger and Biggers bewildered reactions to them etc. About 30% of these candidates squately blamed Mrs. Dalton as being responsible for the manner of Mary's death, in addition to Mary's drunken state also around 40% of these answers were very short (5-10 lines) containing too little or nothing relevant. Some 20% of these answers contained at least developed and adequate details. This question was poorly answered.

Question 6

Comment on the use of irony in the novel.

This was among the least popular but best answered question on the paper. It was attempted by about 30% of the candidates, and over half of them manifested clear understanding of the question's requirements and provided detailed discussions on the various aspects of the question such as the title, Bigger's interactions with Mary and Jan, the approach of Mr. and Mrs. Dalton to the realities of the race segregated society and the ironies in Biggers' perception of the painful life realities he experienced. Even the numerous narrations contained some relevant details of the question's requirement. Only less than 20% of the answers were either irrelevant narrations or very brief notes. Notwithstanding these weaknesses, this question clearly stood out as the best answered one in the whole paper.

Question 7

Justify the view that the novel presents a struggle between good and evil.

Question 8

To what extent can we say that Manfred's downfall is caused by his lust for power?

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
LITERATURE IN-ENGLISH 3

1. GENERAL COMMENTS

The Chief Examiner reported that the standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. The performance was fair. Most questions were about characterization, plot development and themes and were therefore within the Knowledge and scope of those candidates who had endeavored to study the plays and poems.

For African Drama, most schools opted for *Harvest of Corruption* whilst very few schools studied *The Blood of a Stranger*. For Non-African Drama, most schools studied *She Stoops to Conquer* whilst very few schools studied *A Raisin in the Sun*.

In the area of African Poetry, most candidates attempted the question on *Ambush* and fewer candidates attempted the question on *Piano and Drums*. For Non-African Poetry, most candidates attempted the question on *The Pulley* and fewer candidates attempted the question on *Birches*.

2. CANDIDATES' STRENGTHS

There was evidence to indicate that most of the candidates, if not all of them, had at least read, if not studied the poems and plays. Because of this, they were able to write something in relation to the questions posed.

3. CANDIDATES' WEAKNESSES

Notwithstanding the above, most of the candidates were not able to identify relevant evidence from the texts and use them aptly in answering the questions. There were also the perennial problems associated with grammar and expressions, such as spelling, tense, agreement, punctuation, and paragraphing.

4. SUGGESTED REMEDIES

In the light of the above observations, the Chief Examiner made the following recommendations:

- Candidates should be encouraged not just to read the texts and poems but really study them.
- Candidates should make every effort to improve on their knowledge of literary terms, especially those associated with drama and poetry.
- Candidates should endeavour to improve on their competence in the use of English as this would enable them score better grades.
- Books selected by council should be easily available and pamphlets however good they may appear to the candidates, should not be seen as substitutes for the texts and poems themselves.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

AFRICAN DRAMA

Answer **one** question **only** from this section

Question 1

What do you learn about the culture of Mando Land in the play?

This question, on what we learn about the culture of Mando Land in *The Blood of a Stranger* was less popular as it was attempted by only 20% of the candidates, who did so very badly. From the onset, it was obvious that most of them had not read, let alone studied the text. They therefore wrote down what they had studied in their lessons about African culture in general and as a result, scored bad failure marks.

Question 2

Examine Wara's role in the development of the plot.

FRANK OGODO OGBECHE: Harvest of Corruption

This question, on the role of Wara in the development of the plot of *The Blood of a Stranger* was more popular as it was attempted by about 80% of the candidates, who also did not score very good grades. Most of them correctly identified Wara as the main female character in the play and as Kindo's girl friend, but could not say much more than that. Therefore, they failed to impress as the question require much more than that.

Question 3

Justify the title of the play.

This question on justifying the title, *Harvest of Corruption* was popular as it was attempted by about 55% of the candidates. Most of them rightly mentioned corrupt characters in the play and how their actions justify its title. In particular, they mentioned the names of those characters who collaborated with Chief Ade Amaka in his various actions and so scored fairly good grades.

Question 4

Assess the character of Ogeyi in the play.

This question, which required candidates to assess the character of Ogeyi in the play *Harvest of Corruption* was also popular as it was attempted by about 45% of the candidates. They rightly identified her as a University graduate, a born again Christian, and even spoke about the positive role she played in the life of Aloho. For these reasons, they scored fairly good grades.

SECTION B

NON-AFRICAN DRAMA

Answer **one** question **only** from this section

LORRAINE HANSBERRY: A Raisin in the Sun

Question 5

Examine the Youngers as a close-knit family.

This question, on the Younger as a close knit family in *A Raisin in the Sun* was less popular as it was tackled by only 30% of the candidates, who did so badly. It was obvious from the onset that most of the candidates had not really studied the text. Therefore, they did not even know the members of the Younger Family and so could only write about family in a general sense. Therefore, they scored poor grades.

Question 6

How are Mama, Ruth and Beneatha portrayed in the play?

This question, on how Mama, Ruth and Beneatha are portrayed in the play was more popular as it was attempted by 70% of the candidates. Unfortunately, they too had not read the text and so could not write much about the three characters. As a result of this, they scored very poor grades.

OLIVER GOLDSMITH: She Stoops to Conquer.

Question 7

Compare the relationship between Tony and Constance with that between Young Marlow and Kate.

This question, which required candidates to compare the relationship between Tony and Constance with that between Young Marlow and Kate in *She Stoops to Conquer*, was more popular as it was treated by about 80% of the candidates, who did fairly well. It was obvious that they had read the text and therefore did not only know about a bit of the character but were also able to write about the similarities and differences between the two relationships. Hence they wrote fairly impressive essays and accordingly scored good grades.

Question 8

How does Mr. Hardcastle feel towards his stepson?

This question on how Mr. Hard castle feels about his stepson, was less popular as it was only attempted by about 20% of the candidates. Unfortunately, they did not score good grades because apart from mentioning that there is a strained relationship between Mr. Hard castle and Tony, they really were not able to write much. For this reason, they failed to impress the examiners.

SECTION C

AFRICAN POETRY

Answer **one** question **only** from this section

Question 9

Relate the title of the poem Ambush to the theme of frustrated dreams.

This question, on relating the poem Ambush to the theme of frustrated dreams, was more popular as it was attempted by about 60% of the candidates. Unfortunately, they did not score very good marks because even though they mentioned the metaphorical presentation of the land in the poem, they could not properly relate this to the theme of frustrated dreams and so could only register pass grades.

Question 10

Discuss the use of symbolism in Okara's Piano and Drums.

This question, on the use of symbolism in Piano and Drums was equally popular as it was attempted by about 40% of the candidates. They correctly identified the Piano and Drums as respectively symbols of European and African culture, but could not elaborate on other symbols found in the poem. For this reason, most of the candidates did not score very good grades.

SECTION D

NON-AFRICAN POETRY

Answer **one** question **only** from this section.

Question 11

Comment on the use of pun in Herbert's The Pulley.

This question, on the use of *pun* in The Pulley, was popular as it was attempted by about 55% of the candidates. Unfortunately, most of them did not know the meaning of the literary term *pun*, and so could only produce badly written paraphrases of the entire poem. So they did not score very good grades.

Question 12

Examine the theme of endurance in Birches.

This question, on the theme of endurance in the poem *Birches* was also popular as it was attempted by about 45% of the candidates, who did not get very good grades. Once again, it was obvious that they did not know the meaning of the word endurance, and so only presented badly written paraphrases of the entire poem.

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
GENERAL SUBJECTS

1. STANDARD OF THE PAPERS

All the Chief Examiners reported that the standard of the papers of the various subjects was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years.

The questions were within the reach of the candidates as well as the language used. The questions were simple and clear.

2. CANDIDATES' PERFORMANCE

Candidates' performance was reported to be generally poor especially in Christian Religious Studies and Economics. According to the Chief Examiner for Economics, the performance of 80% of the candidates were below average.

The chief examiners for Geography 2 and 3 reported that the general performance of the candidates was average. The Chief Examiner for Islamic Studies report that the candidates performance was far below standard. The Chief Examiner for Government also reported that candidates performance was below average.

The Chief Examiner for History reported that candidates were either not properly taught, not taught at all or did not understand what they were taught considering the the way candidates answered the questions.

3. CANDIDATES' STRENGTHS

The following strengths were reported:

- The Chief Examiner for the Christian Religious Studies reported that candidates did well in sections A and B (Old Testament and Gospel).
- The Chief Examiner for Economics reported that candidates did well in questions 1(a), 2, 3 and 4.
- The Chief Examiner for Geography 2 reported that the performance of the candidates in questions 2, 3, 4 and 8 was better than the other questions. He further highlighted that some candidates showed better understanding of the demands of the questions.
- The chief examiner for Geography 3 expressed that the general performance of some candidates in some centres was good. He further stated that some of the candidates who scored high marks had a clear knowledge and understanding of the topic examined.
- The Chief Examiner for Islamic Studies highlighted that the candidates showed their strengths in questions 2 and 5.
- The chief examiner for History mentioned some improvement generally by some of the candidates in sections A and C. According to him, fewer candidates attempted questions outside the Gambia compared to the previous years. He further observed that the language of the candidates improved slightly.

4. CANDIDATES' WEAKNESSES

The following weaknesses were reported:

- The chief examiner for the Christian Religious Studies reported candidates weakness in the selected Epistle as many of the candidates had no idea of the topics. He further stated that many candidates could not give lessons learnt from the stories.
- Candidates' inability to interpret the questions carefully.
- Candidates' inability to express themselves clearly in explaining some important concepts.
- Candidates inability to spell key words or terms.
- Some candidates found it difficult to draw simple and accurate diagrams.
- Inability to follow the instructions for some candidates for example, answering more than the maximum number of questions required and failure to start a new question on a new page as well as numbering their questions.
- Inability to write legibly.

5. SUGGESTED REMEDIES

The Chief Examiners proposed the following instructions.

- The Candidates and teachers should endeavour to cover the syllabus.
- Candidates should take time to read and understand the given instructions.
- Candidates should be adequately prepared for the examination.
- Candidates should make use of the past papers.
- Regular monitoring of teaching and learning should done in schools.
- Candidates should read extensively to improve their English.
- Candidates should learn how to draw and label diagrams, maps, etc. clearly and accurately.
- Qualified teachers should be employed to teach the subject.
- Parents should discourage their children from watching a lot of television at home.
- Candidates and teachers should making use of the prescribed text books and not to depend entirely on pamphlets written by other teachers.
- Candidates and teachers should encourage students to do more research into their subject matter.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS' REPORT
ECONOMICS 2

1. GENERAL COMMENTS

The questions were generally within the scope of the syllabus and standard for the level it was meant to test. However, the overall performance was poor. About 80 percent of the candidates scored very low marks across and most of their answers showed a lack of preparation. Also, there were discouraging signs given the fact that many of the candidates were using list-like responses and bullet points as a main method of answering questions.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- About 30 percent of the candidates could calculate the price elasticity of demand in question No. 1 (a) and get the answer right.
- Almost 50 percent of the candidates who attempted question No. 2 could solve the demand and supply function and prepare a demand and supply schedule for the month.
- Over 60 percent of the candidates scored more than half of the total marks allocated to questions No. 3 and 4 which was on agriculture.

3. CANDIDATES' WEAKNESSES

The following weaknesses were reported:

- Candidates misunderstanding of questions because of the general English language problem.
- Candidates' inability to clearly express themselves in explaining economic concepts as demanded by the questions e.g. economic development, inflation, perfect competition, monopolistic competition, price taker, price maker, free trade area and common market.
- Poor preparation for the examination (about 60 percent of the candidates).
- Inability to follow the instructions.
- Inability to start a fresh question on a new page and properly numbering the answers.

4. **SUGGESTED REMEDIES**

The Chief Examiner proposed the following recommendations to improve on the performance:

- Candidates should read extensively to improve their English.
- Candidates should be adequately prepared for the examination.
- Candidates should take time to read and understand the given instructions.
- Candidates and Teachers should endeavour to cover the syllabus.
- More exercises on data response should be practiced in school.
- Where possible, candidates should avoid listing or excessive use of bullet points since this can prevent a full explanation or discussion of salient points. Very short comments mean that the development of the explanation or discussion is missing, which may significantly reduce the marks that can be awarded on questions that ask for a discussion.
- Reference to local examples to illustrate answers should be welcomed as this could show a candidate's ability to apply economic concepts to their local environment.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

SECTION A

*Answer **one** question **only** from this section.*

Question 1

A dealer in deep freezers increased the price of his product from \$450 to \$500 and sales dropped from 800 units to 600 units a week.

Use the information above to answer the questions that follow.

- (a)
 - (i) Calculate the price elasticity of demand.
 - (ii) What type of elasticity is it? Explain your answer.
- (b) Calculate the:
 - (i) total revenue of the company before and after the price increase;
 - (ii) change in total revenue.
- (c) What is the effect of the increase in price on the total revenue?
- (d) State **two** factors influencing price elasticity of demand.

About 30 percent of the candidates attempted this question and they were able to calculate the price elasticity of demand and the total revenue before and after price increases.

However, the problems realized were in correctly stating the Price elasticity of demand formula and getting the factors influencing price elasticity of demand correct.

Question 2

The market for apples is represented by the following demand and supply functions:

$$Q_d = 30 - p;$$

$$Q_s = 15 + 2p.$$

- (a) *prepare a demand and supply schedule for the market, given the prices \$2.00, \$4.00 and \$7.00.*
- (b)
 - (i) *Determine the equilibrium price and equilibrium quantity of apples in the market.*
 - (ii) *If the price of apple is fixed at \$3.00, what will be the excess demand or excess supply?*
- (c) *Suppose the demand function changed to $Q_d = 40 - p$. using the prices in (a) above:*
 - (i) *prepare a new demand schedule;*
 - (ii) *does it represent an increase or a decrease in demand?*
 - (iii) *explain your answer in (c) (ii) above.*

Almost 70 percent of the candidates who attempted this question could solve the demand and supply functions and draw the demand and supply schedules correctly. So, very good marks were scored by the candidates.

About 30 percent of the candidates could determine whether it was an increase or decrease in demand and why? This indicates that the concept of change in demand was not understood by the candidates.

SECTION B

*Answer **three** questions **only** from this section.*

Question 3

- (a) *Define land as a factor of production.*
- (b) *State **three** features of land.*
- (c) *Explain four ways in which land contributes to the economic development of your country.*

All the candidates attempted this question with good results for over half the total number of candidates. Explanation of points raised was a major problem for most candidates who scored marginal marks.

Question 4

- (a) *What is subsistence farming?*
- (b) *Distinguish between crop farming and livestock farming with specific examples.*
- (c) *Identify four measures that the government of your country can adopt to boost agricultural production.*

Another popular question, almost answered by all the candidates. The (a) and (b) parts of the question were well answered, except few candidates who could not mention “cash crops” as part of crop farming. For the (c) part of the question, many candidates just mentioned correct points but could not explain them.

Question 5

- (a) State **two** features each of:
 - (i) perfect competition;
 - (ii) monopolistic competition.
- (b) What does it mean for a firm to be a:
 - (i) price taker;
 - (ii) price maker?
- (c) Explain the following sources of monopoly power:
 - (i) acts of parliament;
 - (ii) copyright;
 - (iii) natural monopoly;
 - (iv) cartel.

This question was poorly attempted. About 25 percent of the candidates who attempted it were able to mention the features of perfect competition but not that of monopolistic competition. Candidates misunderstood monopolistic competition to mean monopoly.

The candidates could not define the terms price taker and price maker. The sources of monopoly power were also poorly explained.

Question 6

- (a) Define inflation.
- (b) Identify any **three** causes of:
 - (i) demand-pull inflation;
 - (ii) cost-push inflation

This is another popular question, in addition to questions 1, 3 and 4, many candidates answered but the scores were poor. Many candidates defined inflation as “increase in the price of goods” instead of “persistent increase in the general price level”.

The answers to the causes of demand-pull inflation and cost push inflation were very poor.

Question 7

- (a) What is economic development?
- (b) State **three** features of a developing country.
- (c) Explain any **four** factors that can speed up the economic development of your country.

This question was poorly answered by over 60 percent of the candidates who could not define the term “economic development”. Many of the candidates were confusing the term developing economy to mean advanced or developed countries. The factors that can speed up economic development were also poorly answered.

Question 8

- (a) State **two** features each of:
 - (i) free trade area:
 - (ii) common market.
- (b) Outline **two** advantages and two disadvantages of a common market.

About 3 percent of the candidates poorly attempted this question. This may be due to the fact that this area of the syllabus must have been completely ignored by many teachers.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
GEOGRAPHY 2

1. GENERAL COMMENTS

In general, the paper was of the required standard. The language was very clear and simple. The standard of the paper compared favourably with those of the previous years. The questions covered about 90% of the syllabus.

However, the performance of more than 50% of the candidates showed that they were ill-prepared for the examination.

The questions gave the candidates to score at least 40 out of 80 marks allocated to the paper.

The rubrics were also clear and questions were drawn from very familiar topics. In fact, part (a) of question 1 (one) and questions 2 and 3, question 4 of section B, and questions 7 and 8 of section B were merely repeated topics from previous examinations.

2. CANDIDATES' STRENGTHS

The following strengths were reported:

- Some candidates manifested their thorough understanding of the subject matter and therefore scored very good marks.
- Some candidates also demonstrated better understanding of the demands or requirements of the questions. They were able to draw good maps and they also adhered to the rubrics of the paper.
- In general terms, the performance of the candidates in questions 2, 3, 4 and 8 was better than the other questions. The majority of the candidates that attempted these questions scored at least 50% out of the total marks allocated to them.

3. CANDIDATES' WEAKNESSES

The following factors contributed to the poor performance of the candidates:

- Candidates' inability to interpret the questions correctly.
- The majority of the candidates merely listed points as answers to questions that required detailed explanations.
- Many candidates answered less than the required number of questions i.e. four questions. In fact, some candidates answered only 2 questions.
- Some candidates, in section B of the paper answered questions for candidates Nigeria and Sierra Leone.
- Candidates' inability to draw maps, to locate and name the features required by the questions 4, 5 and 7.
- The use of the words "lack of" instead of "inadequate or insufficient".

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Geography teachers should endeavour to cover at least 90% of the prescribed syllabus.
- Subject teachers should encourage their candidates to take time to read and understand the given instructions e.g. the total number of questions to answer in all and the number of questions to answer from each of the three sections.
- Subject teachers should let their students know that words used in the questions such as highlight, outline, mention etc. mean detailed explanations and not mere listing.
- Subject teachers should also let their students know that words used in examination such as ‘lack of’ earn candidate’s low marks.
- Candidates should make use of the past papers.
- Subject teachers should always endeavour to read the Chief Examiners’ Report and learn from it in order to improve their teaching skills.
- Candidates should endeavour to differentiate the words “lack of” from “inadequate or insufficient”.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

FOR ALL CANDIDATES

*Candidates in Ghana, Liberia, Sierra Leone and The Gambia are to answer **at least one** question from this section while candidates in Nigeria are to answer **two** questions from section.*

Question 1

- (a) *In **three** ways, explain how **each** of the following factors has affected world population.*
- (i) *Advanced technology;*
 - (ii) *Improved medical care.*
- (b) *Highlight **four** factors which account for the high density of population in Java.*

This question was not popular. About 30% of the candidates attempted it.

The part (a) of the question was poorly answered as the question was wrongly interpreted by the candidates. The majority of them scored very low marks.

The part (b) of the question was also poorly attempted by majority of the candidates who scored low marks.

However, some candidates scored good marks as they were able to give general factors for population density.

Some candidates wrote things like teenage pregnancy, polygamous marriages, early marriage etc. as factors which account for the high density of population in Java and they scored no marks at all.

Question 2

(a) State **three** functions of **each** of the following settlements:

(i) Urban

(ii) Rural

(b) Outline **four** areas of interdependence between rural and urban centres(8 marks).

This was the most popular question, about 90% of the candidates attempted it. About 50% to 60% of them scored good marks.

Part (a) of the question was well answered by the majority of the candidates and they scored more than half of the 12 marks allocated.

However, some candidates scored low marks because they merely listed their points such as commercial, administrative, education for functions of urban centres, and farming, hunting, lumbering etc. as functions of rural settlements.

Part(b) of the question was also wrongly attempted by the majority of the candidates. Instead of explaining the interdependence between rural and urban centres, they tabulated their answers thereby comparing the two. This resulted in them scoring no marks.

However, some candidates wrote well explained answers and they scored good marks.

Question 3

(a) Explain **five** reasons why the production of consumer goods is common in developing countries

(b) Outline **five** factors which influence industrial locations.

This was another popular question in section A. About 50% of the candidates attempted it and scored more than 50% of the 20 marks allocated to this question.

Part (a) of the question was poorly or wrongly answered by majority of the candidates and they scored very low marks. This was because the question was largely misinterpreted by most of the candidates. Most of them stated the advantages of producing consumer goods in developing countries instead of answering the question that asked for the reasons why consumer goods are produced in developing countries.

Part (b) of the question was well answered by majority of the candidates. About 50% of them scored more than half of the ten marks allocated to this question, though some of them found it difficult to understand the word “influence” as stated in the question

SECTION B

FOR CANDIDATES IN THE GAMBIA

*Answer **at least one** question from this section*

Question 4

- (a) *Draw a sketch map of Senegambia*

On the map, locate and name:

- (i) *Kaolack, Brikama and Tendaba.*
 - (ii) *Sapu irrigated area and River Ferlo.*
- (b) *Outline **four** factors that encourage tourism in Senegambia.*
- (c) *Highlight **three** problems hindering tourism in Senegambia*

This was another very popular question attempted by about 90% of the candidates.

Part (a) of the question which is the map work, was poorly answered by majority of the candidates who scored very low marks.

Part (b) of the question was the strength of most of the candidates. They scored very good marks. However, as usual, some of them merely listed their points such as favourable climate, historical sites, hospitality of the people etc. and they scored low marks.

Part (c) of the question was poorly attempted by majority of the candidates and they scored poor or no marks at all. Most of them misinterpreted the question and wrote the negative effects of tourism such as prostitution, drug abuse, truancy among other things etc. This was because they misunderstood the word “hindering” as used in the question.

Question 5

- (a) *Draw an outline map of Senegambia*

On the map, mark and name:

- (i) *The railway line from Dakar to Tambacounda.*
 - (ii) *The trans – Gambian highway from Mbour to Kaolack.*
- (b) *Highlight **four** contributions of transportation to the economic development of Senegambia.*
- (c) *Outline **three** problems limiting rail transportation in Senegambia.*

This was a popular question and about 65% of the candidates attempted it.

Like question 4, part (a) of this question was poorly answered by the majority of the candidates because of the map work. As a result of that, they scored low marks.

Part (b) of the question was very well answered by the majority of the candidates and most of them scored more than half of the total 8 marks allocated.

However, some of them scored low marks as they merely listed their points such as employment, revenue for government, foreign exchange etc.

Part (c) of the question was equally poorly answered by the majority of the candidates like part (a).

Most of the candidates scored low marks because they failed to understand the word “limiting” as it was used in the question.

Question 6

Write a geographical account of the interior lowlands of Senegambia under the following headings: -

- (a) Climate;*
- (b) Economic activities;*
- (c) Problems of development.*

This was the most unpopular question of all. Less than 10% of the candidates attempted it and they scored very low marks.

Part (a) of the question was poorly attempted. Candidates failed to give geographical accounts of the interior lowlands of Senegambia relating to its climate.

Part (b) of the question was better answered than part (a) although most of them merely listed their points and they scored low marks.

Part (c) of the question was equally poorly answered like part (a). Most of the candidates scored very poor marks. Some candidates wrote things like lack of capital, lack of social amenities, lack of rainfall etc. as the problems of development in the interior lowlands.

SECTION C

AFRICA

FOR CANDIDATES IN GHANA, LIBERIA, SIERRA LEONE AND THE GAMBIA

Question 7

- (a) Draw a sketch map of Africa*

On the map, locate and name:

- (i) **One** irrigated area in the River Nile Basin;*
 - (ii) **One** irrigated area in the River Niger Basin;*
 - (iii) **One** major town in 7(a) (ii);*
 - (iv) **One** major crop cultivated in 7(a) (ii).*
- (b) List **two** irrigation methods used in the River Nile Basin*
 - (c) Outline **four** problems affecting irrigation farming in the Nile Basin.*

This was the most popular question in section C. About 50% of the candidates attempted it and scored low marks.

As usual, part (a) of the question was poorly answered because of the map work. Some did not draw the map at all, and most of those who drew it presented a wrong outline map of Africa. Some forgot to include Madagascar. The features were not drawn by some candidates, and those who drew the features drew very wrong features especially the River Niger irrigated basin.

About 50% of the candidates scored the 2 marks allocated to part (b) of the question. Equally, about 50% of them failed to provide the right answer because they mentioned wrong things like ‘surface or sub – surface’ irrigation methods.

Compared to parts (a) and (b), part (c) was fairly answered and some candidates scored good marks.

Question 8

Write a geographical account of petroleum production in Niger under the following headings:

- (a) Production areas;*
- (b) Method of production.*
- (c) **Five** ways in which the petroleum industry has contributed to the economic development of Nigeria.*

This was a popular question. About 70% of the candidates attempted it.

The (a) part of the question was not well answered by the majority of the candidates. They found it difficult to mention areas of petroleum production in Nigeria.

The (b) part was equally not well answered. About 10% of them scored low marks because they could not explain the method of petroleum production.

Part (c) of the question was well answered by majority of the candidates and they scored good marks.

However, as usual, some of them merely listed their point and they scored low marks.

Question 9

Write a geographical account of population distribution in West Africa under the following headings: -

- (a) Areas of dense population;*
- (b) Areas of sparse population;*
- (c) Reasons for dense population in 9 (a);*
- (d) **Four** disadvantages of sparse population.*

About 50% of the candidates attempted this question and they scored very low marks.

Parts (a) and (b) of the question were poorly attempted by the majority of the candidates and they scored low or very poor marks. Some of them did not even know the difference between dense and sparse. The majority of them spent their time defining the concepts instead of giving specific examples as demanded by the question.

Part (c) was fairly better answered than parts (a) and (b) by the majority of the candidates and they scored fairly good marks.

Part (d) of the question was very poorly answered by majority of the candidates. Most of the candidates misinterpreted the question and gave reasons for sparse population and not disadvantages and they scored no marks at all.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
GEOGRAPHY 3

1. GENERAL COMMENTS

The Chief Examiner reported that the standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. The questions were simple and clear. The general performance of the candidates was average.

2. CANDIDATES' STRENGTHS

The Chief Examiner for Geography 3 stated that some candidates understood the given topic. Many of them followed the rubrics of the examination by answering the required number of questions.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Poor command of the English Language.
- Misinterpretation of questions.
- Poor spelling especially the key terms.
- Poor presentation of work.
- Inability to differentiate key terms such as 'highlight', 'describe', 'explain', etc.
- Inability to draw simple and accurate diagrams.
- Inability to follow instructions in most papers.
- Most of the candidates were unable to fully amplify their points. They were simply putting down 'bullet points', as it was the case in previous exams. Such points attracted only 50% of the possible scores, at best.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following recommendations:

- Candidates and Teachers should endeavour to cover the syllabus.
- Candidates should read extensively to improve their English.
- Candidates should be encouraged to present diagrams, graphs, etc. clearly and accurately with labels if used. The diagrams should be of a size that can be seen.
- Candidates should take time to read and understand the given instructions.
- Candidates should be given clear guidance to enable them understand the difference between these key words: describe, explain, list, etc. They should also understand that the answers to questions that ask for explanation or description must be presented in the form of sentences, with at least a brief comment on each point.
- Candidates should be adequately prepared for the examination.
- Candidates should make use of the past papers.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

ELEMENTS OF PRACTICAL AND PHYSICAL GEOGRAPHY

*Answer question 1 and any **three** others.*

Question 1

Study the map extract provided on a scale of 1:50,000 and answer the questions that follow.

- (a) Using a vertical scale of 1 cm to represent 200 feet, draw an annotated cross profile of the area marked **A – B** in the southern part of the map.*
- (b) Describe the influence of relief on:*
 - (i) Settlements in the mapped area;*
 - (ii) Transportation network in the mapped area.*
- (c) What is the drainage pattern of the mapped area?*

This is the compulsory question based on a map extract of a region in West Africa. This question was to test the candidates' abilities to read and interpret basic information provided by contour lines and dot symbols.

Understanding the question

Part 1(a) of this question required the candidates to represent the relief along line A – B in the form of a simple line graph. Along this line the values of all contour lines that cut across line A-B and all other features along this line must be noted. The contour values noted should be used to construct the vertical axis. All the points along line A-B that have been marked should now be transferred onto the profile at their respective heights. These points are now linked by a continuous smooth line.

Candidates were also expected to label the main physical and human features along line A – B. They were expected to give the finished work a *title* (i.e. the title given in the question paper).

Part 1(b) of the required question candidates to explain how the nature of the landscape determines the location and distribution of settlements on the mapped area. Here, the effects of vegetation and drainage on settlement location and distribution are not required.

Part 1(c) of the question asked the candidates to simply identify the drainage pattern in the mapped area. That is the manner in which tributaries join the main stream to form either a dendritic pattern, or trellised pattern, or radial pattern, etc.

Generally the performance in question 1 was far below expectations. It was only the (c) part of the question that was properly handled by the candidates. They had no knowledge of how to handle the (a) and (b) parts of the question.

Comments on individual sub-questions

1(a) The performance on this sub-question was far below expectation. Almost 80% of the candidates scored no marks on this sub-question, an indication that they were not prepared for this type of question. A sizeable number of them (60%) attempted to reduce the map because that was what they were prepared for. The remaining 20% of the 80% of those who attempted the question drew the profile but used the wrong scale. They selected a scale that befitted them. They also failed to label any feature. The rest of the candidates (20%) were able to score some reasonable marks because they got both the scale and horizontal distance correct. They were also able to label some of the features.

Expected answers:

- Line A-B is the base line (horizontal axis) and it is 11.6cm long.
- Title: *an annotated cross profile along line A – B.*
- Scale: 1 cm represents 200ft (NB. The contours are not in metres but in feet)
- Annotation: scattered cultivation, gentle slope, foot path, steep slope, col, secondary road, Ebiya settlement, indefinite stream, scrub, knoll or isolated hill.

(b) The general performance in this sub-question was extremely poor. In (b) (i), about 70% of the candidates who attempted this question misunderstood it and therefore scored low marks. They described the distribution of settlement on the mapped area rather than the influence of relief on settlements. Some described the relief of the map. The remaining 30% scored average mark.

In (b) (ii), most candidates committed the same error as in (b) (i). About 75% of them described the transport network on the map and failed to show any link between the transport network and relief. The remaining 25% brought out the relationship between road network and relief but failed to give detail information on this.

Expected answers:

Influence of relief on:

(i) Settlements on the mapped area

- The north-eastern part of the map is made up of rugged relief, hence few isolated compounds are found there.
- The ridge at the south-eastern part of the mapped area has no settlements.
- Built-up settlements are found at the foot of the hills in the south east.
- In the north western part of the map, relief is gentle and undulating, hence many isolated compounds are found.
- The prominent settlements in the mapped area – Ilubusechi, Eganyi, Adogo and Iloshi are located in low-lying landscape.
- Ebiya is located on lowland between hills.
- Many isolated compounds in the south-western part of the map due to the undulating lowlands.

(ii) Transportation network in the mapped area

- Roads avoid steep slopes in the entire map.
- The main road is found in the north-western part of the map where the relief is gently rolling.
- The secondary road avoids hills and ridges at the southern part of the map.
- There are no roads on the eastern end of the mapped area because of the rugged nature and the steep slopes of the land.
- The minor road in the mapped area runs parallel to the rugged relief from the north to the south.
- Only footpaths are found on the eastern parts of the mapped area because of the rugged terrain.
- Roads avoid highlands and take advantage of lowlands in the mapped area.
- The main path in the extreme southeaster part of the mapped area takes advantage of the pass between the ridge and the col.

(c) The performance on this sub-question was average. About 40% of candidates who attempted this sub-question achieved the possible maximum score. They were able to give the correct answer for the pattern of drainage on the mapped area. The remaining 60% gave other patterns of drainage such as trellised, radial etc. Others did not know anything on this sub-question.

Expected answer:

The drainage pattern of the mapped area is dendritic.

Question 2

(a) **Table 1** contains information on the traffic flow for the movement of passengers from Abuja International Airport to other airports in Nigeria in the year 2012. Use it to calculate and construct a flow line chart for the movement of passengers into **Figure 1** on page 3, using a scale of 1mm to represent 10,000 passengers.

Table 1: Traffic flow between Abuja International Airport and other airports in Nigeria in 2012.

<i>Destination</i>	<i>Number of passengers</i>
<i>Maiduguri</i>	<i>20,000</i>
<i>Kano</i>	<i>30,000</i>
<i>Lagos</i>	<i>60,000</i>
<i>Port Harcourt</i>	<i>40,000</i>

A FLOWLINE CHART SHOWING MOVEMENT OF PASSENGERS FROM ABUJA INTERNATIONAL AIRPORT TO OTHER AIRPORTS IN NIGERIA IN THE YEAR 2012

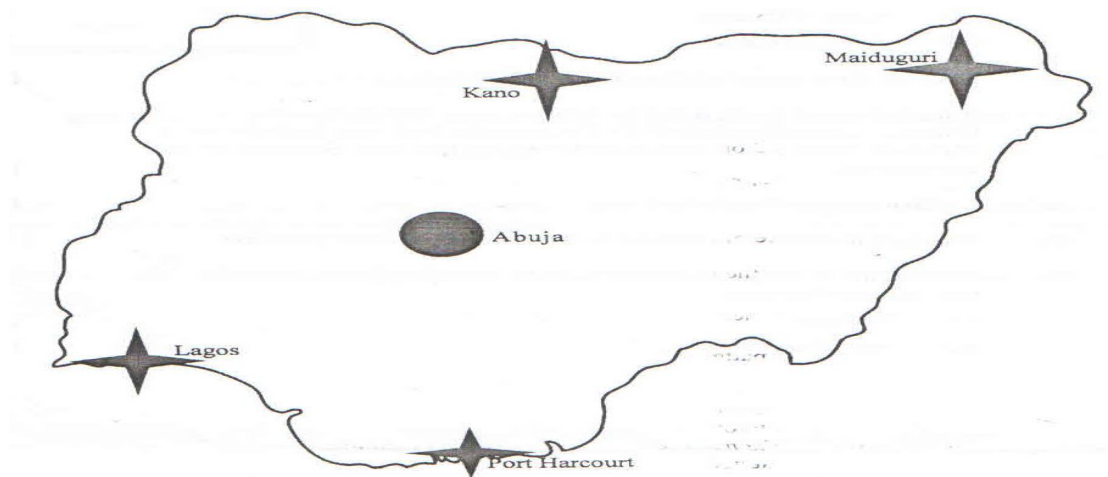


Figure 1

(b) List **three** advantages of flow charts.

This was an unpopular question and the general performance was low.

Understanding the question

Part (a) of the question required candidates to use the map provided to draw flow lines using the statistics in table 1. The width of the lines will be drawn in millimetre and must be proportional to the values on the table. To get the width of each flow line, candidates were required to divide each value by 10,000. Candidates were also required to detach the map from the question paper and this must be submitted along with the answer booklet.

Part (b) of the question asked candidates to provide three reasons why it is beneficial to use flow charts as compared to other cartographic methods.

Comments on individual sub-questions

2(a) This part of the question was fairly attempted by a reasonable number of candidates but attracted low scores. About 90% of the candidates who attempted this question scored low scores marks due to:

- Inability to calculate the widths of the flow lines. Many candidates could not divide each value by 10000. Others used wrong methods of calculation to get the width.
- Wrong plotting of the flow lines –most candidates failed to use the map provided for this exercise. They instead drew the map on their answer booklet and the flow lines were not correctly plotted on the map drawn.

Out of the remaining 10%, about 2% were able to follow the instructions on the question paper and were able to achieve good marks. The remaining 8% scored average marks since they were able to calculate the widths correctly but failed to correctly plot the widths on the map provided.

Expected answers:

Calculating the width of flow lines:

- Maiduguri – $20,000 / 10,000 = 2 \text{ mm}$
- Kano – $30,000 / 10,000 = 3 \text{ mm}$
- Lagos – $60,000 / 10,000 = 6 \text{ mm}$
- Port Harcourt – $40,000 / 10,000 = 4 \text{ mm}$

2 (b) Candidates did not score good marks on this part of the question. Most of them, about 75%, could not come up with any convincing advantage. Of the remaining 25%, 20% of them were able to score good marks while the remaining 5% scored no marks.

Expected answers:

Advantages of flow lines:

- Easy to calculate flow widths with scale;
- easy to understand;
- easy to plot on maps;
- shows relative importance of nodes (cities);
- catches attention;
- attractive;
- provides clear graphic data for development planning;
- most commonly used method of representing movements on maps;
- easy to distinguish important and less important routes;
- easy comparison of volume of movement, etc.

Question 3

- (a) *State the difference between erosion and mass movement.*
- (b) *List **four** agents responsible for modifying landform.*
- (c) *Outline **three** factors that influence mass movement.*

This was a popular question and the general performance was encouraging especially parts (a) and (c) of the question.

Understanding the question

3 (a) This was a straightforward question asking the candidates to briefly show how *erosion* could be different from *mass wasting* and not what they understand by the term *erosion* and *mass wasting*.

3(b) This question wants the candidates to describe any four factors that lead to alteration of the landscape.

Comments on individual sub-questions

3(a) The general performance on this sub-question was good. Almost 95% of those who attempted this question scored the maximum possible mark. The remaining 5% scored low marks due to:

- (i) Tabulating the difference between erosion and mass wasting.
- (ii) Unrelated responses.

Expected answer:

Difference between erosion and mass movement:

Erosion is driven by agents such as running water, wind and glacier while mass movement is driven by the earth's gravitational force.

3 (b) There were few good responses for this sub-question (about 30%). Candidates were able to clearly describe the agents responsible for modifying landform. References were made to various factors relating to climate, geological activities, vegetation, human activities etc. Poor responses came from about 70% of the candidates who could score nothing but below average.

Expected answers:

Agents responsible for modifying landforms:

- surface running water;
- underground water;
- volcanism;
- earthquakes;
- glacier/ice;
- waves/seas;
- wind;
- living organisms;
- force of gravity;
- variations in temperature;
- rainfall.

3(c) Responses here were good. About 50% of the candidates who attempted this question achieved the maximum possible mark. Out of the remaining 50%, 20% scored half the marks because of mere listing of points. The remaining 30% scored low marks because of limited knowledge on the topic.

Expected answers:

- gravity;
- structure of rocks;
- nature of slope/gradient of slope;
- crustal instability/earthquakes, volcanic activities;
- activities of man;
- rainfall;
- temperature variations;
- activities of animals and plants;
- presence of vegetation;
- undercutting of slopes by waves and rivers;
- depth of weathered materials;
- presence of lubricating moisture;
- nature and weight of rock materials.

Question 4

- (a) List **three** characteristics of metamorphic rocks.
- (b) Describe **three** modes of formation of metamorphic rocks.
- (c) Outline **three** economic benefits of rocks.

This was a very popular question attempted by 95% of the candidates. The question was drawn from a familiar topic. The general performance was good. Some candidates were able to score excellent marks. Most candidates generally appeared to understand and interpret the questions successfully especially in parts (a) and (c).

Understanding the question

4(a) This was a straightforward question asking the candidates to briefly describe the nature/distinguishing features of metamorphic rocks.

4(b) This question required the candidates to describe **three** methods of the formation of metamorphic rocks.

4(c) This question wanted candidates to explain the uses of rocks to man.

Comments on individual sub-questions

4(a) This question attracted good scores. About 85% of the candidates who attempted it scored the maximum possible mark. They were able to clearly show the characteristics of metamorphic rocks. The remaining 10% either scored one mark or nothing because of the following:

- Problem of spelling key term such as crystalline, non-fossilised, gneiss, etc.
- Limited knowledge of this type of rocks.
- Supplying answers related to the other types of rocks such as igneous or sedimentary rocks.

Expected answers:

Characteristics of metamorphic rocks:

- changed rocks/formed from existing rocks;
- may remain crystalline in structure if formed from igneous rocks;
- may retain layers if formed from sedimentary rocks;
- exist in different colours;
- exist in different textures;
- may be jointed;
- may be hard and resistant;
- non-fossilised;
- could be brittle;
- e.g. gneiss, slate, marble etc.

4(b) This part of the question proved to be problematic for a reasonable number of the candidates. Almost 40% of them could not correctly explain a single process of the formation of metamorphic rocks. Some of them were giving responses related to the formation of sedimentary rocks. Out of the remaining 60%, 40% of them only listed down or name the mode of formation of metamorphic rocks but could not amplify the points. The remaining 20% did extremely well. Their explanations were accurate and they even backed them up with examples. This group of candidates undoubtedly scored good marks.

Expected answers:

Description of the modes of formation of metamorphic rocks:

- Formed from pre-existing rocks (igneous, sedimentary, or metamorphic rocks);
- Thermal or contact metamorphism – from high temperature;
- Regional or dynamic metamorphism – from high pressure;
- Thermo-dynamic metamorphism – from combined heat and pressure;
- Metasomation metamorphism – from chemically active fluids.

4(c) This sub-question was also well attempted. The majority of the candidates successfully answered this question by explaining how rocks are useful to man. Only about 10% of the candidates who attempted this question scored low marks because they failed to give specific examples.

Expected answers

Economic benefits of rocks:

- Source of food nutrients e.g. rock salt;
- Source of water, e.g. aquifer;
- Source of fertilizer, e.g. potash;
- Industrial raw materials, e.g. limestone;

- Source of material for craft, e.g. clay;
- Building materials/construction purposes, e.g. granite;
- Tourism/tourist centres, e.g. Olumo Rocks, Devil Rock, Bumi hills;

- Source of employment, e.g. quarrying;
- Ornaments, e.g. diamonds;
- Source of minerals, e.g. bauxite, iron ore;
- Defence, e.g. Golan Height;
- Source of fuel, e.g. coal;
- Source of metal, e.g. iron, tin;
- Domestic uses, e.g. grinding stone;
- Demarcation of boundaries, e.g. Mt. Nimba, Cameroun Mts.;
- Source of soils for farming and other economic activities;
- Source of medicine , e.g. kaolin;
- For research purposes;
- Revenue to government, e.g. tax from miners;
- Foreign exchange to government.

Question 5

- (a) *With the aid of annotated diagrams, describe the characteristics of the various stages of a river course.*
- (b) *List **three** ways in which rivers are beneficial.*

This was also a very popular question attracting about 70% of the candidates. The performance in both parts of the question was encouraging.

Understanding the question

5(a) This question required the candidates to describe the distinguishing features of each of the three stages of a river. It also required the candidates to draw relevant diagrams to aid their explanations.

5(b) This was a simple and straightforward question requiring the candidates to state three ways by which rivers are useful. The question is asking for the 'importance' of rivers.

Comments on individual sub-questions

5(a) About 60% of the candidates who attempted this question scored good marks. They were able to correctly describe the characteristics of each stage of a river. Out of the remaining 40% of the candidates, 20% of them mixed up the features by placing a feature or characteristics for example of the upper course in the middle course. Out of the remaining 20%, 10% had a sketchy idea of the characteristics of the stages of a river. The remaining gave irrelevant answers and produced poor diagrams.

Expected answers:

Description of the characteristics of the various stages of a river course

Upper/youthful/torrential Course:

- MARKS the beginning/source of a river;
- Steep slope;
- Occurs in highland area;
- Swift or fast flowing;
- Vertical erosion is dominant;
- Headward erosion occurs;
- Presence of some interlocking spurs;
- Valley is V-shaped;
- Potholes formed;
- River capture may occur;
- Occurrence of waterfalls/rapids/cataracts;
- Presence of gorges.

Middle/mature/valley course:

- Lateral erosion is dominant;
- Valley is U-shaped;
- Valleys are widened;
- Increased load of river;
- Slope/gradient is more gentle;
- Dominant work of the river is transportation;
- Volume of the river is increased from additional tributaries;
- Velocity is reduced;
- Meanders begin to form;
- Little deposition;
- Interlocking spurs are numerous;
- Presence of river cliffs;
- Presence of river bluffs.

Lower/Old/Plain course:

- END of the river course;
- Main work of the river is deposition;
- Lateral erosion;
- Increased volume of water from additional tributaries;
- Speed is greatly slackened;

- The gradient of slope is gentle;
- Rejuvenation may occur;
- Presence of levees;
- Presence of ox-lakes;
- Wide flood plains;
- Pronounced meanders;
- Presence of deltas/estuaries;
- Braided channels;
- Presence of distributaries;
- Presence of sand bars;

5(b) This sub-question was also well attempted. The majority of the candidates successfully answered this question by explaining how rivers are useful to man. Only about 10% of the candidates who attempted this question scored low marks because they failed to give specific examples.

Expected answers:

Ways by which rivers are beneficial:

- Demarcating boundaries;
- Fishing/employment;
- Domestic purposes;
- Source of food;
- Industrial uses;
- Source of minerals;
- Transportation;
- Tourism;
- Irrigation;
- Provision of fertile silt;
- H.E.P generation;
- Provision of sand for construction;
- Recreation/sports;
- Religious purpose.

Question 6

(a) *Draw an outline of the Earth and show the following:*

- (i) *Equator*
- (ii) *Tropic of cancer*
- (iii) *Antarctic Circle*

(b) *Describe **three** characteristics of lines of longitude.*

- (c) *A football match is scheduled for 5:45 pm local time on Saturday in Onitsha, Nigeria (longitude 7°E). Calculate the local time football fans Mambolo, Sierra Leone (longitude 13°W) can tune their radio sets for the commentary.*

This was also a very popular question well attempted by about 80% of the candidates. The performance in this question indicated that what actually attracted the candidates to this question was the (a) and (b) parts of the question. The performance in the (c) part was far below expectation.

Understanding the question

6 (a) Candidates were asked to draw a simple circle representing an outline of the Earth, then draw a horizontal line dividing the circle into two halves to represent the equator. Further north of the equator another line must be drawn to represent the Tropic of Cancer, and then closer the South Pole another line must be drawn to represent the Antarctic Circle. These lines must be labelled correctly.

6(b) This question asked candidates to describe the characteristics of the lines of longitude i.e. how they look like on the globe and their uses.

6(c) This sub-question asked candidates to simply calculate the local time of Mambola, Sierra Leone taking into consideration the time and longitude of Onitsha (Nigeria)

Comments on individual sub-questions

6(a) The general performance on this question was good. Almost 90% of those who attempted this question scored the maximum possible marks. The remaining 10% scored low marks due to:

- Poor diagrams.
- Wrong labelling – the labelling did not correspond to the lines under discussion.

Expected answers:

Outline of the Earth:

- (i) Equator (Lat. 0°)
- (ii) Tropic of Cancer (Lat. $23\frac{1}{2}^{\circ}$)
- (iii) Antarctic Circle (Lat. $66\frac{1}{2}^{\circ}$)

6(b) This sub-question was reasonably popular and generally well responded to. About 90% of the candidates were able to describe the characteristics of lines of longitude. Out of the remaining 10%, 6% merely listed the characteristics without giving any development, thus scored half the marks. The remaining 4% gave irrelevant responses.

Expected answers:

Characteristics of lines of longitude:

- Longitude is angular distance of a place east or west of the Greenwich Meridian.
- Measured from the centre of the Earth.
- Imaginary lines running from north to south of the globe.

- Distance between two longitudes decreases towards the poles.
- Used in calculating local time.
- Have equal length.
- Used in locating places.
- Meet at the poles.
- Marked between 0° and 180° east and west of the Greenwich Meridian.
- All opposite longitudes form a Great Circle.
- Greenwich Meridian is the reference point of all longitudes.
- Lines of longitude are also called meridians.
- Distance between two lines of longitude is widest at the Equator.

6 (c) This proved to be a difficult question for most candidates. The mathematical aspect of the question was challenging. It was poorly attempted. About 10% of the candidates who answered this question supplied correct answers by following the correct procedure on how to calculate the local time of a place. The remaining 90% struggled with calculations.

Expected answers:

Calculation of time:

Mambolo is on longitude 13°W

Onitsha is on longitude 7° E

Longitudinal difference = 13°W + 7° E = 20°

15° of longitude = 1 hour

Time difference between the two towns = $20^\circ \times 1 \text{ hr.}/15^\circ$
 = 1 hr 20 mins or 1 3/4 hours

Since Mambolo is west of Onitsha the time will be behind, so we subtract

That is, time in Mambolo = 5:45 pm – 1 hour 20 minutes
 = 4:25 pm on Saturday

Question 7

(a) List **five** sources of water pollution.

(b) Highlight **five** measures that can be taken to control water pollution.

Understanding the question

7 (a) This sub-question wanted the candidates to simply write down the sources of waterpollution. That is, things that contaminate water and render it not useful for man.

7(b) In this sub-question candidates were required to describe or explain the measures or means to minimize or prevent water pollution. Candidates were expected to look at the ways man/communities tries to stop water pollution.

Comments on individual sub-questions

7(a) This question was well attempted by about 85% of the candidates. Many candidates (about 45%) gained their 5 marks for this question by naming the correct sources of water pollution. Of the remaining 55%, 35% either named two correct sources of water pollution or one correct source. The remaining 20% supplied irrelevant answers.

Expected answers:

Sources of water pollution:

- Herbicides
- Pesticides
- Industrial waste discharge
- Heat from power and industrial plants
- Use of chemical fertilizers
- Flooding
- Acid rain
- City drainage
- Untreated sewage
- Cloud seeding
- Mining
- Discharge from ships
- Fishing with chemicals
- Dumping of refuse in water
- Erosion materials
- Volcanic eruption
- Oil spillage
- Leakage from landfills
- Washing of cloths in rivers with detergent
- Animal dung in rivers

7(b) This question was also well attempted by 90% of the candidates. This group of candidates had good ideas of the ways water pollution could be controlled. The remaining 10% of the candidates scored low marks due to:

- Misinterpretation of the question.
- Vague expressions.
- Irrelevant materials.

Expected answers:

Measures that can be taken to control water pollution:

- Controlled use of herbicides;
- Controlled use of pesticides;
- Control of air pollution;

- Control of floods;
- Good drainage;
- Enforcement of legislation against improper disposal of toxic wastes;
- Good management of industrial effluents;
- Proper channelling of thermal fluids;
- Good management of sewage;
- Use of organic manure;
- Good livestock management practices;
- Use of good fishing methods;
- Formation of awareness clubs in schools;
- Enlightenment programmes;
- Erosion control measures.

Question 8

With the aid of diagrams, explain how the following factors affect the temperature of a Place.

- (i) *Latitude;*
- (ii) *Aspect and slope.*

This was not a popular question despite the fact that it was a simple question. It only attracted about 20% of the candidates. The overall performance was way below average.

Understanding the question

8 (a) This question required candidates to explain the influence of latitude, aspect and slope on the temperature of a place. That is, how latitude, aspect and slope determine the temperature of a place.

Comments on individual sub-questions

8 (a) (i) This sub-question was very poorly answered. Only few (about 8%) of the candidates were able to score average marks. The rest were just writing anything that came to their minds.

Expected answer:

How latitudes affect the temperature of a place:

- Places that are near the equator are warmer than places near the poles
- At the Equator the sun is always high in the sky.
- As such, the sun shines vertically on the earth's surface.
- Therefore, heat is concentrated on a smaller area which becomes hot.
- Towards the poles the sun's rays fall at an oblique angle.
- As such, the rays have a greater area to heat.
- The sun's rays travel through longer distances hence the intensity reduces.

- Because much of the heat is absorbed by clouds and dust particles.
- It takes the land longer time to warm up due to low intensity of solar energy.
- In general temperature decreases as one moves from the Equator towards the poles.

8 (a) (ii) Answers for this part of the question were also very poor. Candidates had limited knowledge of this topic.

Expected answers:

How aspect and slope affect the temperature of a place:

- The influence of slope and aspect on temperature is noticeable in temperate latitudes.
- In the tropics, the sun is always high in the sky so the aspect and slope of the land do not affect temperature.
- In the northern hemisphere, south-facing slopes receive more insolation than the north-facing slopes; hence the south-facing slopes are warmer.
- North-facing slopes are sheltered from the sun; hence the north-facing slopes are cooler.
- In the southern hemisphere north-facing slopes receive more insolation than the south-facing slopes, hence they are warmer.
- On the contrary, the south-facing slopes in the southern hemisphere receive less insolation hence they are cooler.
- The influence of slope on temperature is noticeable in mountainous areas.
- Slopes facing the sun receive a lot more insolation than sheltered areas; hence slopes facing the sun are warmer than sheltered areas.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
GOVERNMENT 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years but the general performance was below average. The questions set gave the candidates an opportunity to score the pass mark. The rubrics were clear. In addition, questions were drawn from familiar topics of the syllabus. However, there was abundant evidence from the scripts of some centres that a good number of the candidates were not properly prepared for the examination.

2. CANDIDATES' STRENGTHS

Candidates' strengths were as follows:

- About 90% of the candidates provided appropriate answers to questions 1,2,6,8 and 10 and very good marks were scored such as 10,12, and 15.
- Also about 70% of the candidates exhibited a high degree of legible and clear work.
- Over 85% of the candidates followed the rubrics of the examination by answering two (2) questions from section A and two (2) from section B.
- Nearly 95% of the candidates again followed the instructions of the examination by not answering questions specifically reserved for candidates in Nigeria, Sierra Leone and Ghana.

3. CANDIDATES' WEAKNESSES

Candidates' weaknesses were as follows:

- About 40% of the candidates could not express themselves in simple and concise English Language, making their answers clumsy to read and understand.
- Examiners also observed that about 5% of the candidates started answering a question, for example on page 2 of Answer Booklet and referred the Examiner to page 6 for continuation of the same question.
- The inability of about 10% of the candidates to spell key government words.
- About 10% of the candidates answered more than one question on a page of the answer Booklet,
- The points raised by 20% of the candidates in answering their questions were mostly mere mentioning of points,
- Nearly 5% of the candidates provided unnecessary introductions to questions.
- Examiners also observed that about 10% of the candidate answered more questions than required, instead of any four (4). Some even answered six (6) questions. This made the marking not only difficult but time consuming.

4. SUGGESTED REMEDIES

The following recommendations will help improve candidates' performance:

- Candidates should improve upon their command of the English Language by reading many books on different subjects.
- Candidates should desist from the practice of using two different pages for a question.
- Candidates should be discouraged from answering more than one question on a page of the Answer Booklet. Every question should start on a fresh page.
- Candidates should be made to understand that whatever point they raised must be explained.
- Candidates should avoid providing unnecessary introduction or excessive details to a question, as marks are not mostly awarded for such details.
- Teachers should give out tests and assignments to students as frequently as possible. Such exercises will help indicate possible weaknesses and strengths of the candidates before the examination.
- Finally, schools should employ qualified and experienced teachers to prepare the candidates for the examination.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A ELEMENTS OF GOVERNMENT FOR ALL CANDIDATES

*Answer **two** questions **only** from this section.*

Question 1

- (a) *What is a legitimate government?*
- (b) *Outline any **four** features of legitimacy*

About 85% of the candidates answered this question but marks scored on the average were only satisfactory, about 6 out of 15. About 40% of the candidates could not clearly define the concept of legitimacy in government and to explain what makes a leader or government legitimate.

Question 2

- (a) *What are rights?*
- (b) *Highlight **four** limitations on the rights of a citizen.*

Nearly 80% of the candidates attempted this question, but the average score was low, about 5 out of 15. About 20% of the candidates found it difficult to define rights, as they linked it with duties and obligations. They could not also explain properly the various limitations on citizens' rights resulting in their satisfactory performance.

Question 3

- (a) *Differentiate between a de jure and de facto one party system*
- (b) *Outline **four** advantages of a multi – party system.*

This question was not popular, only about 30% of the candidates attempted it. The average performance was poor, about 4 out of 15. Candidates found it difficult to explain de jure and de facto one party systems. The advantages of multi – party system was clumsily done.

Question 4

- a) *What is a simple majority system?*
- b) *Outline **four** demerits of the system.*

Quite an unpopular question, only about 30% of the candidates answered it with very low marks such as 3 out of 15. About 20% of those who attempted it did not know the difference between simple majority and Absolute majority systems, since they used the definition of the latter for the former. The explanation of the demerit of the system was poorly done resulting in the poor performance.

Question 5

*Identify **five** ways by which the central government can improve upon local government system in West Africa.*

About 20% of the candidates attempted this question, and the average marks scored were also low, about 3 out of 15. 10% of the candidate wrongly interpreted the question to mean the functions of local government bodies instead of writing about what central government should do to improve on local government activities.

SECTION B

FOR CANDIDATES IN THE GAMBIA

*Answer **two** questions **only** from this section.*

Question 6

*Highlight **five** roles of women in the pre – colonial wolof kingdom.*

Another popular question among 80% of the candidates. But the average performance was only satisfactory about 6 out of 15. 20% of the candidates were able to raise similar outlines but the explanations were poorly done, thus making them score low marks.

Question 7

- (a) *What is a crown colony?*
- (b) *Highlight **four** functions of the Secretary of State for the colony under The British colonial system.*

This question was attempted by 40% of the candidates. They could not appropriately define the crown colony as areas settled and ruled directly by The British colonial administration. About 10% of the candidates merely wrote on the functions of The British colonial Governor instead of the Secretary of State for the colonies. The average performance was therefore unsatisfactory. about 3 out of 15.

Question 8

*State **five** factors that contributed to the lengthy rule of the peoples' progressive party (PPP) in The Gambia.*

A very popular question attempted by about 95% of the candidates. Marks scored were equally high ranging from 8 to 15. However, about 5% of the candidates wrote on the achievements of the party such as provision of schools etc.

Question 9

- (a) *What is foreign policy?*
- (b) *State **four** factors that influence The Gambia's foreign policy.*

This question was popular among 85% of the candidates and the average marks scored were satisfactory about 6 out of 15. However, the definition for foreign policy was poorly done. The factors that influence The Gambia's foreign policy was not properly explained.

Question 10

*Outline any **five** contributions of The Gambia towards the growth of The Economic Community of West African states (ECOWAS).*

This question was very popular among 95% of the candidates attempted it and the average performance was equally good, about 8 out of 15. About 30% of the candidates wrote similar outlines but their explanations to these points were not appropriately done else they would have scored better marks.

WASSCEFOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
HISTORY 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. The questions were clear and straightforward but the general performance was poor. The problem with the paper was that candidates were either not properly taught, not taught at all or did not understand what they were taught. Some technical words such as features, benefitted, factors, etc. were not understood considering the way questions were answered. These words are related to history and therefore teachers and candidates are expected to know them.

It was also discovered that some very poor candidates attempted questions from Nigeria, Ghana, Sierra Leone and Liberia, although the number was much less than in previous years.

2. CANDIDATES' STRENGTHS

Generally some of the candidates have improved considerably as some of them read widely as was noticed in sections A and C. This shows that as the syllabus gets nearer to their own time they will continue to improve. Also this year, less than 2% of the candidates attempted questions outside The Gambia as stated earlier. This also showed a significant improvement as over the years many candidates had been answering questions from Nigeria, Sierra Leone and Ghana. It is also observed that the language of candidates has improved slightly. Candidates are therefore encouraged to read as widely as possible.

3. CANDIDATES' WEAKNESSES

It was generally observed that:

- Some candidates still did not know how to spell even simple words.
- Some candidates also did not write legibly and this accounted for some of them losing marks.
- Some candidates did not fully understand the rubrics as they answered from only two sections instead of three.
- Some candidates did not do well in sections A and B in particular.
- Pamphlets written by their teachers or somebody else, which are not well written, were the books they used and this could not help them.
- Some candidates did not understand the meaning of answering at least one question from each section. They answered only three questions.

4. SUGGESTED REMEDIES

The following recommendations will help improve candidates' performance:

- Students and teachers should be encouraged to use the prescribed text books and not depend on pamphlets written by teachers.
- Teachers should endeavour to cover the syllabus.
- Students and teachers should ensure that they complete the syllabus.

- Students should endeavour to read all other books, besides text books to improve on their understanding and comprehension of the English language.
- Candidates should learn how to spell correctly.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

PART II

HISTORY OF THE GAMBIA

SECTION A

THE GAMBIA UP TO 1800

*Answer **at least one** question from this section.*

Question 1

- (a) Name any **three** sources used in writing the history of The Gambia.
- (b) Outline any **four** disadvantages of Oral Tradition as a source of African history.

This was a very popular question as about 65% or so of the candidates attempted it. Some of the candidates, who attempted, about 60% scored good marks for the (b) part. However the (a) part was not well answered by some of the candidates who attempted it. Many of them did not know the sources of history. About 80% of those who knew the sources knew only Oral Tradition, Written History and Archaeology. Unfortunately some could not spell Archaeology and therefore got it wrong. It seems as if for the majority of the candidates only those three sources were taught. Others sources include Linguistics, Ethnography, or Anthropology, Numismatics, Ethnomusicology, etc.

For the (b) part they needed to have stated some of the following – Oral Tradition lacks chronological order; specific time frame; the information may be distorted, it lacks precision, etc.

Question 2

- (a) List any **three** articles of trade among the Fula in The Gambia before 1800.
- (b) Highlight any **four** factors that caused the migration of the Fula to The Gambia

This was fairly a popular question which was fairly answered by most of the candidates who attempted it. Generally they knew some of the articles such as rice, maize, slaves, cattle, butter, hides and skins, etc. However some included articles that were exchanged in the trans-Saharan trade such as kolanuts, cowrie shells, etc.

For the (b) part, the candidates scored fairly good marks as they understood the question. Unfortunately they could not score full marks as they did not develop their answers. They stated over population of families, to spread Islam, to establish their own states, inter-ethnic conflicts, to search for grazing land for their cattle, etc. If they had developed these and other possible answers they could have scored much higher marks.

Question 3

- (a) State any **three** qualities expected of an elected King in pre-colonialGambia.
- (b) In what **three** ways were the Council of King makers important in pre- colonial Gambia.

This was also a popular question in this section, though it was generally not well answered. For the candidates who attempted this question less than 5% scored marks for the (a) part. They gave answers such as he should be from the royal class, be a Muslim, be a soldier, etc. They needed to have stated Fame, Wisdom, Bravery, Impartiality, Integrity, Honesty, etc. For the (b) part most of the candidates who answered this question stated that the king makers elected the kings, deposed kings, and served as a check on the powers of the king, etc. However they did not fully developed these points. Consequently, they lost valuable marks.

SECTION B

THE GAMBIA IN THE 19TH CENTURY

Answer **at least one** question from this section.

Question 4

- (a) Name the **two** Soninke Kings killed during the Soninke-Marabout Wars of the 19th century.
- (b) Name the Soninke King of Kombo who was forcefully converted to Islam by Foday Kombo Sillah
- (c) What **four** factors contributed to the defeat of the Soninke by the Marabout?

This was not a very popular question especially for (a) and (b). As one would expect it was generally not well answered. For the (a) and (b) parts candidates gave names such as Musa Molloh, Foday Kombo Sillah, Sundiata Jatta, etc. They were expected to have given Suling Jatta, and Jereba Marong and for (b) Tuman Bojang. A sizable number of candidates knew both answers and therefore scored full marks. For the (c) part the majority of candidates who attempted this question knew some of the answers. They stated that they had superior weapons, they used magic or charms, they were inspired by jihadists like Dan-Fodio and the belief that anyone killed in that battle would go to Paradise. They were therefore inspired. On the other hand, the Soninke were disunited and poor. Some of the candidates who knew the names could not spell Suling, Jereba or Tuman.

Question 5

- (a) Name any **three** Christian missionaries who came to The Gambia in the 19th century.
- (b) In what **four** ways did the Christian missionaries contribute to the suppression of the slave trade in The Gambia?

This was a popular question although it was not well understood. Many of the candidates who attempted it instead of stating the names of three Christian missionaries they gave the names of Christian missions such as Anglican, Methodists, Roman Catholic and Baptist.

They therefore scored no marks for this section. Names such as William Singleton, Anne-Marie Javouhey, John Baker, Robert Hawkins, etc. should have been stated. Many of the candidates knew the answers

to the (b) part they however lost marks when they stated that they introduced western education and converted people to Christianity. They did not give detailed development to the introduction to western education. Western education on its own or Christianity on its own could not stand. It was the awareness and the evil of this practice that were emphasised. Those who developed their answers scored very good marks.

Question 6

- (a) Identify any **three** factors that contributed to the founding of Bathurst in 1816.
- (b) In what **two** ways did Captain Alexander Grant contribute to the development of Bathurst.

This question was fairly popular. Most of the candidates who attempted it understood what was being asked. They stated factors such as to suppress the trans-Atlantic slave trade along the river Gambia; founded for the re-settlement of freed slaves from Sierra Leone; founded for trade; etc. They therefore scored good marks. The (b) part was a bit misunderstood as most of the candidates either repeated some of the answers in (a) or gave wrong answers. They should have stated that Grant negotiated and concluded the treaty that brought about the purchase of Bathurst from the king of Kombo. He did the planning and layout of Bathurst. He named the streets of Bathurst after British officials, etc.

SECTION C

THE GAMBIA IN THE 20TH CENTURY

Answer **at least one** question from this section.

Question 7

- (a) Mentioned any **three** British governors who served in The Gambia between 1900 and 1960.
- (b) Highlight any **four** roles played by local chiefs in the Indirect Rule System.

This was a very popular question as about 60% of the candidates attempted it. Most of them knew the roles played by local chiefs. However not up to 1% of the candidates who attempted this question knew the governors who served within that period. There were fourteen of them and these included John Middleton, Richmond Palmer, Thomas Southorn, Edward Henry Windley, Cecil Hamilton Armitage, etc. It was observed that even the very few who knew the names failed to score marks because they either spelt these names wrongly or stated only the surname. It was assumed and agreed that for candidates to score marks, they should mention at least the first and last names. For the (b) part candidates scored fairly good marks as they knew some of the roles of chiefs. They stated that they were responsible for the collection of taxes, they handled minor criminal and civil cases, they supervised and executed projects such as construction of roads, markets etc.

Question 8

*Highlight any **five** features of the colonial economy of The Gambia.*

This was a very unpopular question in the whole paper as about 1% of the candidates attempted it. The majority of the candidates who attempted this question did not have a glimpse or idea of what was being asked. Those who attempted it performed poorly. May be they did not understand the term features and economic. They wrote on the effects of the trans-Atlantic slave trade or the Industrial Revolution. They were expected to have stated some of the following, Banking was introduced but credit facilities were denied Gambian businessmen. Trade was monopolised by British merchants and companies. Marketing boards were established, Construction of roads, etc. It was concluded that teachers neglect topics like this.

Question 9

*Identify any **five** ways by which The Gambia has benefitted from her membership of the Economic Community of West African States (ECOWAS).*

This was the most popular question in the whole paper as about 75% of candidates attempted it. Generally the candidates who attempted it understood what was being asked. However a sizable number of them did not understand what was being asked. Some of the candidates listed the reasons for the setting up of ECOWAS and not what Gambia has benefitted from her. For instance they stated that the larger market has been created. Not surprising candidates stated that ECOWAS intervened in the political impasse in The Gambia in January of this year. Candidates and teachers are reminded that the cut off period for history is the year 2000. Any examples outside this period are current affairs and will be treated as such.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
ISLAMIC STUDIES 2

1. GENERAL COMMENTS

This year's paper was within the syllabus and the students were expected to perform well in the exams. The questions were clear with no ambiguity but students' performance was far below the standard required. This can be attributed to the students' attitude towards the subject, thinking that they can easily pass it without putting in extra effort. Another scenario is that the students attempted questions without understanding the real meaning of the questions.

2. CANDIDATES' STRENGTHS

Candidates had demonstrated their strength, in only question 2 and 5. They were able to bring some relevant points.

3. CANDIDATES' WEAKNESSES

Candidates weaknesses can easily be seen in questions 1, 3, 4 and 6 as the majority of them failed to obtain the required pass marks for these questions. They also demonstrated their weaknesses by not being able to understand what some of these questions were really asking for which consequently was the reason for their poor performance.

4. SUGGESTED REMEDIES

The following recommendations will help improve candidates' performance:

- The syllabus should be covered in full.
- Parents should limit the amount of time their children spend on watching movies at home.
- School authorities should have more control over the students.
- More qualified teachers should be employed to teach the subject.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **four** questions in all. Question 1 is compulsory.*

Question 1

Discuss the contributions of Umar b. Abdul Aziz to the development of Hadith.

This was a compulsory question which all candidates were to answer and it was a clear question. You cannot study the collection and compilation of Hadith without knowing the role played by Umar b. Abdul Aziz in it. Some of the candidates wrote about Umar b. Khatab instead of Umar b. Abdul Aziz. The points to be raised included:

- He is known as Umar the second.
- He was Umayyad caliph.

- He was the first man to give orders for the collection of Hadith.
- He ordered Abu Bakr b. Hazim to see the collection of Hadith.
- He encouraged the establishment of hadith collection points.
- He reigned for two and half years, etc.

Question 2

- (a) *Define Tafsir.*
- (b) *Mention the various types of Tafsir.*
- (c) *Highlight the significance of Tafsir.*

There are some areas where the students performed fairly well like number two and five. This was a question attempted by almost 70% of the candidates and 60% of them performed very well in all the three parts of the question. Some were able to give the correct definition of Tafsir as the interpretation or explanation on the meaning of the quranic verses, mentioned the various types of Tafsir like Tafsirul Quran Bil Quran, Tafsir-ulquran bil hadith and Tafsir-ul Quran bil rahy and give some points on the significance of Tafsir.

Question 3

Outline the criteria for authenticating the main of a hadith.

This was an unpopular question. Candidates who attempted it could not score any significant points. Most of them wrote about the Isnad instead of the matn, the criteria which includes, that the hadith should not contradict a verse of the Quran or an authenticated hadith or contradict nature, etc.

Question 4

Explain the social benefits of sawm.

This was well attempted by students. 60% of the students attempted it. Some were able to bring in relevant points like the rich having sympathy for the poor, bringing unity among worshippers, creating the environment for worshippers, recitation of the Quran, etc. Some also wrote about the religious and economic benefits of Sawm.

Question 5

Describe the essentials for a valid marriage in Islam.

This was one of the most popular question in which about 80% of students attempted it and were able to bring relevant points like, the mutual agreement, the consent of the parents, paying of dowry, two witnesses. Etc. Some were able to mention only two or one of the essentials. It was a good attempt on the part of the students.

Question 6

Highlight the role of Hajj in the spread of Islam in West Africa.

This was one of the most unpopular question attempted by 10% of the students. This showed that candidates had no knowledge of the question. Only few were able to mention the role Mansa Musa played by bringing architects to build mosques, the pilgrims dressing code and the scholars who were going round preaching.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
CHRISIAN RELIGIOUS STUDIES 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. A total of five hundred and twenty-eight (528) candidates sat for the paper this year.

However, the performance was generally very poor. About 2% of the candidates scored between 40 and 43 marks, out of 60 marks. About 9% scored between 30 and 39 marks and the rest were between 0 and 29 marks.

2. CANDIDATES' STRENGTHS

Most of the candidates' high performance was in section A and B, that is, Old Testament and the Gospels. Their scores were higher in these areas than in section C, the selected Epistles. A good number of the candidates demonstrated good knowledge in these two sections.

3. CANDIDATES' WEAKNESSES

The general weakness of the candidates was in the selected Epistles. Many had no idea of the topics while others confused the stories.

There were a lot of pious talks and preaching in their answers. Many candidates could not give lessons learnt from the stories. There were also some candidates who mixed up the stories in their answers.

4. SUGGESTED REMEDIES

The following recommendations will help improve candidates' performance:

- Adequate preparation should be done by the candidates in schools.
- The use of past papers will help candidates understand how questions are set and how to answer them.
- Each candidate should have a copy of the Bible (RSV).
- Teachers should be constantly sensitized on exam expectations through reading Chief Examiners' Reports.
- Inter- class or school quiz with attractive incentive for students should be conducted to enhance the learning of the Bible.
- The teaching and learning of Christian Religious Studies should constantly be monitored in schools.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

THEMES FROM THE OLD TESTAMENT

*Answer **at least one** question from this section.*

Question 1

(a) Narrate the dreams of Pharaoh.

*(b) In what **three** ways did the interpretation of the dreams effect Joseph and his people?*

This question was attempted by 46% of the candidates. Most of them were familiar with the story of Pharaoh's dreams and gave good answers.

However, some candidates mixed up Pharaoh's dreams with those of Joseph.

Question 2

(a) Trace the circumstances that led to the call of Deborah to battle with Jabin.

*(b) Mention **three** ways women can contribute to national development.*

Only 16% of the candidates attempted this number. Generally, it was poorly answered.

Most candidates did not clearly state the ways women contribute to the development of the nation. These ways include ways evangelism, farming, teaching, politics, health, education, etc.

Question 3

(a) Outline the circumstances that led David to serve in the house of Saul.

*(b) What **three** lessons learn from the causes of Saul's downfall?*

29% of the candidates attempted this question. Most of them deviated from the immediate event that led to David serving in the house of Saul. The event was that Saul was tormented by an evil spirit because of disobedience. So David was called to play the harp to appease the spirit.

Some candidates narrated the story of David and Goliath.

Question 4

(a) Describe King Josiah's religious reform in Israel.

*(b) State **four** ways Christians can maintain the purity of their religion.*

This was the second most unpopular question. About 19% of the candidates attempted it. Most of them demonstrated a complete lack of knowledge of the question. The reform made by King Josiah included:

- Ordering Hilkiah, the priest to bring out all vessels made for Baal and Asherah and all other gods.

- Burning the vessels outside Jerusalem and taking the ashes to Bethel;
- Deposing idolatrous priests ordained by the King of Judah.
- Breaking down the houses of the male cult prostitutes who had taken over the house of the Lord.
- Chasing out high priests from the temple where they burned incense to the gods.

SECTION B

THEMES FROM THE SYNOPTIC GOSPELS AND THE ACTS OF THE APOSTLES

Answer **at least one** question from this section.

Question 5

- (a) Describe the temptation of Jesus as recorded in the gospel of Mathew.
- (b) In what **three** ways were the temptations significant to Jesus in his ministry?

This was the most popular question among the candidates. About 75% of them attempted it and did well.

Generally, the candidates knew the story but some mixed Luke's account with that of Matthew. The temptation in Matthew was from the wilderness to the Temple and then Mountain, while Luke had from the Wilderness to the Mountain and then Temple.

Some of the candidates could not state the significance of the temptations to Jesus' ministry. The significance include:

- Acceptance of suffering to achieve God's purpose;
- Assuring his followers that they too can overcome the devil;
- Overcome bribers with material things thereby avoiding such instances.
- Assuring his followers the supremacy of God.

Question 6

- (a) Highlight the activities of **each** of these characters during the crucifixion of Jesus Christ:

- (i) The two robbers;
- (ii) Joseph of Arimathea.

- (b) In what **three** ways are the behaviour of the robbers significant to Christians?

About 47% of the candidates attempted this question. Most of the candidates were familiar with the story about the two robbers at the crucifixion of Jesus. They were able to indicate the significance of the behaviour of the robbers to Christians. However, some confused the order of events.

Again, some confused Simon of Cyrene with Joseph of Arimathea who buried Jesus.

Question 7

- (a) *Describe the Communal Living of the Early Church.*
- (b) *What **three** lessons can be learnt from the life of the Early Church?*

Only 23% of the candidates answered this question. Their scores were very poor.

Many candidates were not writing on the teaching of the Early Christian Life e.g. they sold their properties and shared the money; ate their meals together; worshipped together, etc.

SECTION C

THEMES FROM SELECTED EPISTLES

*Answer **one** question **only** from this section.*

Question 8

- (a) *Recount James' advice to Christians on how the poor and the rich should to be treated in the Church.*
- (b) *State **four** reasons why people should **not** discriminate against each other.*

This was another popular question. About 62% of the candidates attempted it. However, many wrote answers that were out of context. James gave a sample of how the poor and the rich were treated in the Christian gathering. He condemned the way the poor were discriminated. He preached that all should be treated equally.

Question 9

- (a) *Outline Peter's teaching on Christian's attitude to civil authorities.*
- (b) *State **three** reasons for submission to civil authorities.*

About 23% of the candidates attempted this question. It was also poorly answered. Many candidates could not discuss on Peter's teaching.

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
MATHEMATICS

1. STANDARD OF THE PAPER

All the Chief Examiners reported that the standard of the paper was appropriate, within the scope of the syllabus and compared favourably to those of the previous years. The Chief Examiner for Further Mathematics even stated that was simpler than those of the previous years.

2. CANDIDATES' PERFORMANCES

Both the chief examiners of Mathematics and Further Mathematics express concern on the poor performance by the candidates which is below average though it was little better than the previous years.

3. CANDIDATES' STRENGTHS

The Chief Examiners for Mathematics reported candidates' strengths as follows:

- Ability to use vein diagram to form equation.
- Ability to clear denominations and open brackets.
- Ability to work out logarithmic functions, inverse functions and polynomials.

4. CANDIDATES' WEAKNESSES

Candidates' weaknesses were reported as follows:

- Misinterpretation of questions.
- Inability to translate word problems to numerical expressions.
- Inability to solve trigonometric equations.
- Inability to cover the syllabuses.

5. SUGGESTED REMEDIES

The following suggestions were given by the chief examiners to improve on candidates' performance:

- Candidates and teachers should endeavour to cover the syllabus.
- Candidates should be adequately prepared for the examination.
- Students should be encouraged to read and understand examination's instructions before answering questions.
- Candidates should study mathematical concepts very well and retain them.
- Candidates should familiar themselves with the use of mathematical instruments (Graph, calculators, compass, etc.).

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
GENERAL MATHEMATICS (CORE) 2

1. GENERAL COMMENTS

The paper was of the required standard but poorly answered. There were no misleading or ambiguous questions. The questions were straightforward and required just an average understanding of the basic fundamentals of the subject.

It covers about 80% of the WASSCE syllabus. Candidates' general performance is a little better than those of the previous years. The modal mark scored is zero (0) even though some few candidates scored mark within the 90s.

2. CANDIDATES' STRENGTHS

Candidates showed some strengths in:

- Clearing denominators and opening brackets.
- Forming equations and simplifying logs.
- Finding the first term and common difference of AP.
- Using Venn diagram to form an equation.
- Completing table of values for quadratic equation.
- Modular arithmetic and probability.
- Representing given information in a diagram.

3. CANDIDATES' WEAKNESSES

Candidates showed the following weaknesses:

- Word problem in speed, distance and time.
- Drawing neat diagram to represent information.
- Use the scale given correctly to draw the graph.
- Solving problems involving commercial mathematics.
- Find the interquartile range.
- Solving trigonometric equations, proportion, geometry and simple column vector.
- Inability to follow the instructions. Most of the candidates failed to include the units required by certain questions for instance questions 1b,3a and b and question 6 a and b .
- Candidates should be advised to present their work in a clear manner.

4. SUGGESTED REMEDIES

The following are suggestions aimed at improving the performance of the candidates in mathematics:

- Candidates should be encouraged to learn concepts very well and retain them.
- Candidates should read the questions carefully and understand them before attempting to answer them.

- Candidates should possess their own calculators and learn to use them before the examination.
- Teachers should exercise patience with the candidates when explaining concepts.
- Teachers should emphasise the need for their candidates to read the rubrics of each question before answering.
- Candidates should endeavour to answer each question on a fresh page otherwise;
- Candidates should be informed that answers to questions involving money must be expressed to 2 decimal places unless otherwise stated.
- The omission and use of wrong units should be discouraged.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

SECTION A

*Answer **all** the questions in this section.*

Question 1

- (a) *If $(y - 1) \log_{10} 4 = y \log_{10} 16$, without using Mathematical tables or calculator, find the value of y .*
- (b) *When I walk from my house at 4 km/h, I will get to the office 30 minutes later than when I walk at 5 km/h. Calculate the distance between my house and office.*

This was a very popular question but poorly answered. About 73% of the candidates attempted this question. Out of this, only few of them scored full marks of 8.

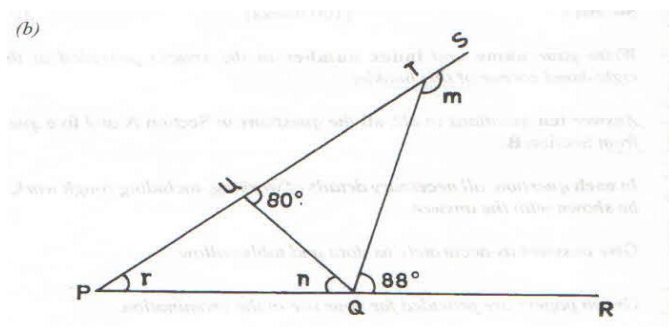
For the (a) part, some of the candidates made a good attempt in simplifying the logs but for most of the candidates instead of $\log_{10} 4^{(y-1)} = \log_{10} 16^y$ they wrote $\log_{10} 4(y - 1) = \log_{10} 16y$ which cannot give you $y = -1$

The (b) part of the question was poorly answered. The main problem was that most candidates were not able to interpret the question and come up with the equations to find the distance. Instead of $5x = 4(x + 0.5)$ they reversed it and wrote $5(x + 0.5) = 4x$. However, few of the candidates were able to come up with the right equations and hence got the full mark.

Answer = 10km.

Question 2

(a) solve the equation: $\frac{3}{5}(3x-5) - \frac{3}{5}(2x-3) = 3$



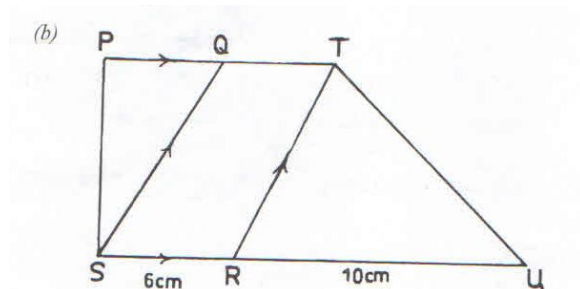
In the diagram, $\angle STQ = m$, $\angle TUQ = 80^\circ$, $\angle PQU = n$ and $\angle RQT = 88^\circ$. Find the value of $(m + n)$.

This was also a very popular question and well answered. About 75% of the candidates attempted this question out of which 39% scored zero (0) marks while about 12% scored 8 marks.

- (a) In this part of the question, candidates manifested a good strength in multiplying by the LCM and opening the brackets i.e. $10(3x - 5) - 9(2x - 3) = 45$ and $30x - 50 - 18x + 27 = 45$ and hence $x = 5\frac{2}{3}$ or 5.67
- (b) Most of the candidates manifested a total weakness in this part of the question. Because most of the candidates juggled with a variety of methods without reasonable mathematical facts to substantiate their answers. Answer obtained were correct but were preceded by wrong /inappropriate methods. Instead of using properties of triangle they used parallel lines i.e. instead: $r + n = 80$ or $\angle UTQ = 180 - m$ or $n + \angle UQT + 88 = 180$ they used $n = 80$ or $m = 88$.
Answer $n + m = 172$

Question 3

- (a) The angle of depression of a point P on the ground from the top T of a building is 23.6° . if the distance from P to the foot of the building is 50 m, calculate, correct to the nearest metre, the height of the building.

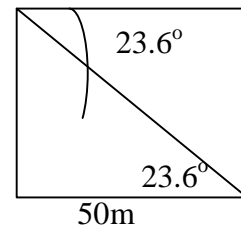


In the diagram, $PT \parallel SU$, $QS \parallel TR$, $SR = 6$ cm and $RU = 10$ cm. If the area of $\triangle TRU = 45$ cm^2 , calculate the area of trapezium QTUS.

This was a very popular question but fairly answered. About 75% of the candidates attempted the question. Out of this, 75% scored at least 2 out of the full mark.

- (a) Most of the candidates were able to draw the diagram but locating the angle of depression and giving the answer to the nearest meter was a major weakness. Their main strength was $h = 50 \tan (23.6)$

Answer = 22m



- (b) In this part of the question, Candidates were expected to calculate the area of trapezium QTUS. Candidates' major problem was getting the height = 9cm and $|QT| = 6$ cm and few of the candidates were able to get the area of Trapezium QTUS = 99cm^2

Question 4

If the sixth term of an arithmetic Progression (a.P.) is 37 and the sum of the first six terms is 147, find the :

- (a) *first term;*
(b) *sum of the first fifteen terms.*

This was a popular question and well answered. About 76% of the candidates attempted this question out of which 58% scored at least 5 out of the 8 marks. Candidates were expected to find the first term of an A.P and the sum of the first fifteen terms given that the sixth term is 37 and the sum of the first 6 terms of the A.P is 147.

- (a) Candidates showed a very good strength in writing the equation $a + 5d = 37$ or $2a + 5d = 49$ and getting the value of $a = 12$
(b) Most of the candidates demonstrated a good strength in getting $d = 5$ and $S_{15} = \frac{15}{2} [2(12) + (15 - 1)5]$ and hence $S_{15} = 705$.

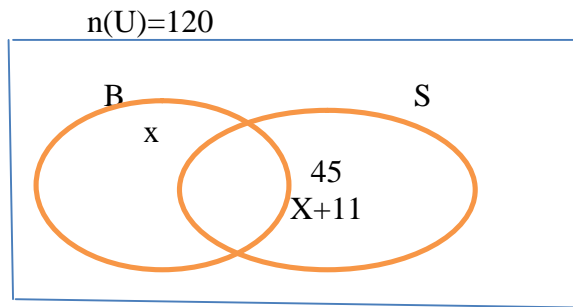
Question 5

Out of 120 customers in a shop, 45 bought both bags and shoes. If all the customers bought either bags or shoes and 11 more customers bought shoes than bags:

- (a) *illustrate this information in a diagram;*
(b) *find the number of customers who bought shoes;*
(c) *calculate the probability that a customer selected at random bought bags.*

Candidates were expected to draw a Venn diagram and use it to find the number of students who bought shoes and the probability that a student selected at random bought bags.

Few accurate Venn diagrams were displayed with the correct entries in each region. There was a 65% accuracy with this question. However, some 35% had problems inserting the correct information in the correct regions. Some drew circles that did not overlap and later struggled with equations which led them to the correct answers. It is unimaginable how candidates can reach at correct answers read from wrong diagrams.



Answer: b) 88

c) $\frac{77}{120}$ or 0.6417

SECTION B

Answer **five** questions only **from** this section.

Question 6

- (a) A manufacturing company requires 3 hours of direct labour to process every ₦87.00 worth of raw materials. If the company uses ₦30,450.00 worth of raw materials, what amount should it budget for direct labour at ₦18.25 per hour?
- (b) An investor invested ₦ x in bank M at the rate of 6% simple interest per annum and ₦ y in bank N at the rate of 8% simple interest per annum. If a total of ₦8,000,000.00 was invested in the two banks and the investor received a total of ₦2,320,000.00 as interest from the two banks after 4 years, calculate the:
- values of x and y ;
 - interest paid by the second bank.

This question was quite unpopular. About 95% of the candidates who attempted it scored less than half of the total marks allocated to this question. It was indeed poorly answered to say the least.

Few candidates managed to use the correct method but lost marks because they could not express their answers to 2 d. p.

Answer for (a): ₦19162.50

- (b) This question proved to be the most difficult for most of the candidates. About 80% of them failed to obtain the correct equation connecting the two given bank rates.

Answers for (b) (i): ₦3,000,000.00

(b)(ii): ₦1;6000;000.00

Question 7

- (a) Copy and complete the table of values for the equation $y = 2x^2 - 7x - 9$ for $-3 \leq x \leq 6$.

x	-3	-2	-1	0	1	2	3	4	5	6
y		13		-9	-14		-12		6	

- (b) using scales of 2 cm to 1 unit on the x-axis and 2 cm to 4 units on the y-axis, draw the graph of $y = 2x^2 - 7x - 9$ for $-3 \leq x \leq 6$.
- (c) use the graph to estimate the:
- roots of the equation $2x^2 - 7x = 26$;
 - coordinates of the minimum point of y;
 - range of values for which $2x^2 - 7x < 9$.

Candidates were expected to copy and complete the table of values for the equation; $y = 2x^2 - 7x - 9$ for $-3 \leq x \leq 6$

About 85% of the candidates successfully completed the table correctly. They however had problems using the scales that were given. The scale of 2 cm to 1 unit was easy to use but that of 2cm to 4 units proved rather difficult to locate. The marks for accurate plotting of the points were lost. Consequently, marks for reading the graph i.e for parts ci,ii,iii were also lost.

(c)(i) $-2.2 \pm 0.1, 5.8 \pm 0.1$

(c)(ii) $1.9 \pm 0.1, -15$

(c)(iii) $(-1 \pm 0.1) < x < (4.5 \pm 0.1)$

Question 8

Marks	1	2	3	4	5
Number of students	$m+2$	$m-1$	$2m-3$	$m+5$	$3m-4$

Table shows the distribution of marks scored by some students in a test.

- (a) If the mean mark is $3\frac{6}{23}$, find the value of m.
- (b) Find the:
- interquartile range;
 - probability of selecting a student who scored at least 4 marks in the test.

Candidates were expected to find the value of m given that the mean mark was $3\frac{6}{23}$ and to use the value of m to find the interquartile range of the distribution.

About 65% of the candidates were able to obtain the value of m correctly. Some had problems adding the frequencies (number of students). Another common problem was the conversion of $3\frac{6}{23}$ to an improper fraction. With a wrong value of m obtained, they could not obtain the correct value of the interquartile range.

Answer: $m = 3$, Upper quartile=4, lower quartile=2 and hence interquartile range =2

c) $\frac{13}{23}$ or 0.5652

Question 9

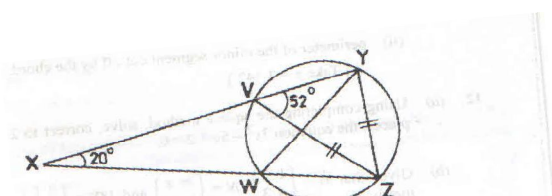
(a) PQ is a tangent to a circle RST at the point S . PRT is a straight line, $\angle TPS = 34^\circ$ and $\angle TSQ = 65^\circ$.

(i) Illustrate the information in a diagram.

(ii) Find the value of:

(A) $\angle RTS$;

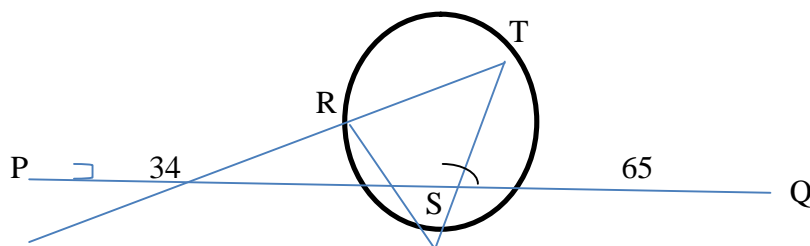
(B) $\angle SRP$.



(b)

In the diagram, $IVZI = IYZI$, $\angle YZZ = 20^\circ$ and $\angle ZVY = 52^\circ$. Calculate the size of $\angle WYZ$.

Candidates were expected to illustrate their answer in form of a diagram and to use it to obtain unknown angle using simple angle properties. Their diagrams were woefully wrong and as such they could not proceed.



Answer (ii) (A) $\angle RTS = 31^\circ$

(ii) (B) $\angle SRP = 115^\circ$

The (b) part was poorly answered. Most of the candidates juggled with inappropriate angle properties and arrived at the correct answers. It was agreed that correct answers obtained through in-appropriate methods deserve no mark.

Answer: $\angle WYZ = 20^\circ$

Question 10

(a) Given that $\sin x = \frac{5}{13}$, $0^\circ < x < 90^\circ$, find $\frac{\cos x - 2 \sin x}{2 \tan x}$.

(b) A ladder, LA , leans against a vertical pole at a point L which is 9.6 metres above the ground. Another ladder, LB , 12 metres long, leans on the opposite side of the pole and at the same point L . If A and B are 10 metres apart and on the same straight line as the foot of the pole, calculate, correct to 2 significant figures, the:

(i) length of ladder LA ;

(ii) angle which LA makes with the ground.

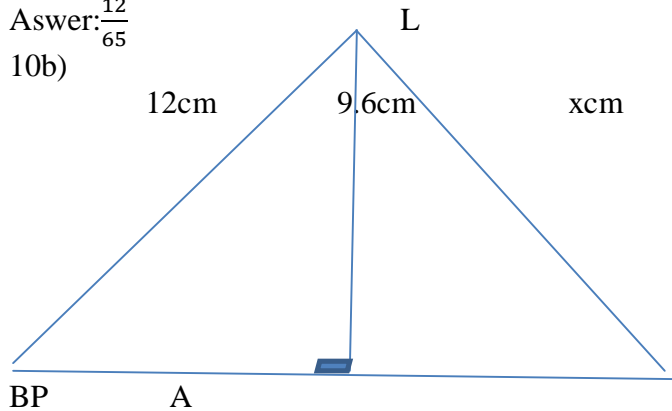
Candidates were required to evaluate $\frac{\cos x - 2\sin x}{2\tan x}$ given that $\sin x = \frac{5}{13}$ for $0^\circ < x < 90^\circ$

This part of the question was well answered, about 65% of the candidates answered this question correctly. However about 10%, obtained the value for x in degrees and substituted in the expression.

This resulted in the loss of the accuracy marks.

Answer: $\frac{12}{65}$

10b)



This question was fairly answered. About 65% of the candidates drew the correct diagram as shown above. Such candidates correctly used Pythagoras theorem and obtained the correct answers.

But about 35% of the candidates drew the wrong diagrams and consequently missed the answers.

Answer(b): (i) 10m

(ii) 74°

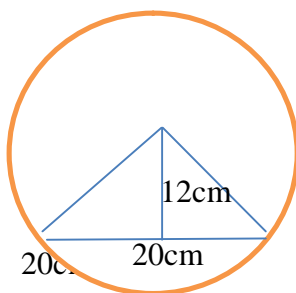
Question 11

- (a) *It takes 8 students two of an hour to fill 12 tanks with water. How many tanks of water will 4 students fill in one-third of an hour at the same rate?*
- (b) *A chord, 20 cm long, is 12 cm from the centre of the circle. Calculate, correct to one decimal place, the:*
- angle subtended by the chord at the centre of the circle;*
 - perimeter of the minor segment cut off by the chord.*
- [take $\pi = 3.142$]

(a) Candidates were to calculate how many tanks of water can be filled by 4 students in one-third of an hour given that 8 student took two-thirds of an hour to fill 12 tanks.

This question proved rather confusing for a majority of the candidates. They were unable to get a connection between the given condition and the latter. $12 \times 20 \div \frac{8 \times 40}{4} = 240 \div 80$ Answer = 3 tanks.

(b)



In this question representing the information in a diagram was a major problem for most of the candidates. Most of them took the 12cm to be the radius hence getting it all wrong

Answer: (i) $\tan\left(\frac{\theta}{2}\right) = \frac{10}{12}$ Answer $\theta = 79.6^\circ$

(ii) 41.7cm

Question 12

(a) Using completing the square method, solve, correct to 2 decimal places, the equation $3y^2 - 5y + 2 = 0$.

(b) Give that $M = \begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$, $N = \begin{pmatrix} m & x \\ n & y \end{pmatrix}$ and $MN = \begin{pmatrix} 2 & 1 \\ 4 & 4 \end{pmatrix}$, find the matrix N

Candidates were required to use the method of completing the squares to solve the quadratic equation $3y^2 - 5y + 2 = 0$

This question proved rather too difficult. Some resorted to using the quadratic formula whilst others made fruitless attempts to factorise it. Candidates that used the correct method, however lost marks because they could not express their answers to 2 decimal places as required by the rubrics of the question.

Answers like: $y(3y-5)+2=0$ where written as factors by some candidates.

12 (b) Candidates were expected to obtain the matrix N given that $M = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$, $N = \begin{bmatrix} m & x \\ n & y \end{bmatrix}$ and $MN = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$. Candidates common error was their inability to multiply 2X2 matrices and to use the idea that if two matrices are identical, then their corresponding components can be equated. Some however interchanged the components of matrix M and N. This resulted in the loss of much needed marks.

Answer 12 (a): $x=1.00$ or $x=0.67$

(b): $N = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

Question 13

(a) The operation $(*)$ is defined on the set of real numbers, R , by $x(*)y = \frac{x+y}{2}$, $x, y \in R$.

(i) Evaluate $3(*)\frac{2}{5}$.

(ii) If $8(*)y = 8\frac{1}{4}$, find the value of y .

(b) In $\triangle ABC$, $AB = \begin{pmatrix} 4 \\ -6 \end{pmatrix}$ and $AC = \begin{pmatrix} 3 \\ -8 \end{pmatrix}$. If P is the midpoint of AB , express CP as a column vector.

(a) (i) Candidates were expected to use the operation $(*)$ defined on the set of real numbers R by: $X(*)Y = \frac{x+y}{2}$ to evaluate $3(*)\frac{2}{5}$. This part of the question was well answered by about 50% of the candidates. However some, had problems simplifying after they have substituted.

Part (ii) of the same question received some attention by some of the candidates. Solving for y was a problem for most of the candidates.

Part (b) was an unpopular question. About 90% of the candidates refrained from answering this question. Most of the candidates who attempted this question failed to score all the 6 marks that were allocated to it. Their main strength was in getting vector $AP = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Answers (a) (i): $\frac{17}{10}$ or $1\frac{7}{10}$ or 1.7

(ii): $y = 8\frac{1}{2}$ or 8.5 or $\frac{17}{2}$ b ii) $CP = \begin{pmatrix} -5 \\ 11 \end{pmatrix}$

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
FURTHER MATHEMATICS/MATHEMATICS (ELECTIVE) 2

1. GENERAL COMMENTS

The paper was simple and straighterforward as the previous years. The rubrics were very clear. However, the general performance of the candidates is below average. About 50% of the candidates scored below 40.

2. CANDIDATES' STRENGTHS

Some of the candidates showed some understanding in Inverse functions and Internal division of a line segment in a given ratio in question 1(a) and (b), Logarithm in question 3(a), factors of polynomials in question 4, cumulative frequency in question 6, vectors in question 7, Resultant of forces in question 8, Partial fractions in question 10(a), Combined A.P. and G.P in question 11(b), Equilibrium of forces in statics and vertical motion under gravity in Dynamics in question 14(a) and (b) and finding angle between two vectors and perpendicular vectors in scalar product in question 15(a) and (b).

3. CANDIDATES' WEAKNESSES

Most candidates failed to answer questions on:

- Definite Integral by substitution in question 2.
- Rate of Change in question 3 (b).
- Binomial distribution in question 5 and 12.
- Trigonometry and equation of line joining the stationary points and the distance between them in question 9 (a) and (b).
- Drawing a histogram using frequency density and class boundaries.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Teachers should exercise patience in explaining concepts to the students.
- Candidates should be encouraged to study concepts very well and retain them.
- Teachers should ensure that there is sufficient time for revision after covering the syllabus.
- Candidates should effectively know how to use their Mathematical instruments, calculators and graph books before examination time.
- Teachers should train candidates how to better approach WASSCE questions using past examination questions.
- Students should learn how to present their solutions properly and to answer the questions correctly to the given degree of accuracy.

- Teachers should try to cover as much as possible the syllabus and especially the most important areas.
- Students and teachers should give much attention on application or real life problems.
- *Aki Ola Series Elective Mathematics* for Senior High Schools by Peter Asiedu would be of great help to the students.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

Answer **all** the questions in this section.

Question 1

- (a) If $f(x) = \frac{4-5x}{2}$ and $g(x) = x+6$, $x \in \mathbf{R}$, find $f \circ g^{-1}$.
- (b) $P(x, y)$ divides the line joining $(7, -5)$ and $(-2, 7)$ internally in the ratio 5:4. Find the coordinates of P .

The(a)part of the question was simple. It required the candidates to first find the inverse of g and then finally find the $f \circ g^{-1}$. However, there was a good attempt by about 30% of the candidates but about 15% of the candidates scored a zero.

The(b)part of the question was also simple and straightforward. It required candidates to find the coordinate using formula of internal division of a line segment in a given ratio. About 90% of the candidates scored zero. For a better understanding of this topic, *Aki Ola Series Elective Mathematics* for Senior High Schools by Peter Asiedu is a good reference material.

Question 2

Evaluate $\int_1^3 \left\{ \frac{x-1}{(x+1)^2} dx \right\}$

This question was standard and it required the candidates to first use the correct substitution of letting $u = x + 1$ which implies $x = u - 1$ to get the correct integrand. Then integrate and substitute the limits to get **0.193** as the final answer. But, the majority of the candidates about 65% scored zero. However, less than 10% of the candidates scored up to half of the mark and above but none of the candidates scored full mark.

Question 3

- (a) Given that $\log_{10} p = a$, $\log_{10} q = b$ and $\log_{10} s = c$, express $\log_{10} \frac{p^{\frac{1}{3}} q^4}{s^2}$ in terms of a , b and c .

- (b) The radius of a circle is 6 cm. If the area of the circle is increasing at the rate of $20 \text{ cm}^2 \text{ s}^{-1}$, find, leaving the answer in terms of π , the rate at which the radius is increasing.

The(a) part of the question was simple because it involved the use of the laws of logarithm. About 35% of the candidates scored full mark and about 20% scored zero because of failure to apply the laws of logarithm. The logarithm function was not well placed on the question paper. The log and the expression attached to it were detached on the question paper. This is not the Mathematical way of writing log functions.

The(b) part of the question was standard as it involved application of rate of change by first differentiating and then substituting to get the answer. But some of the candidates about 50% scored little or no mark. However, more than 10% of the candidates scored full mark.

Question 4

If $(x + 1)$ and $(x - 2)$ are factors of the polynomial $g(x) = x^4 + ax^3 + bx^2 - 16x - 12$, find the values of **a** and **b**.

This question was one of the most famous and simple. It involved substitution and then solving simultaneous equations to get $a=4$ and $b=-1$ as the answers. More than 50% of the candidates scored full mark and less than 2% scored zero.

Question 5

Bottles of the same sizes produced in a factory are packed in boxes. Each box contains 10 bottles. If 8% of the bottles produced are defective, find, correct to **two** decimal places, the probability that a box chosen at random contains a **least** three defective bottles.

This question was standard as it involved the use of binomial probability distribution by first finding the probability of non defective as 0.92 and then proceeds to solve using the correct methods. However, about 15% of the candidates scored full mark and 30% scored zero mark.

Question 6

The table shows the heights in cm of some seedlings in a certain garden.

Height (cm)	36 – 40	41 – 45	46 – 50	51 – 55	56 – 61
Frequency	3	9	21	12	5

- Draw a cumulative frequency curve for the distribution.
- Using the curve in 6(a), find the semi interquartile range.

This question was straightforward as it involved drawing and reading from the graph. However, about 20% scored below half of the total mark.

Question 7

A parallelogram $MNQR$ has vertices $M(4, -6)$, $N(10, 2)$, $Q(8, 16)$ and $R(x, y)$. Find the coordinates of **R**

This question was straightforward as it involved two methods: either finding any two equal vectors and then solving and equating them to get the answer. About 25% of the candidates scored full mark. On the other hand, 25% of the candidates scored zero.

Question 8

Forces F_1 (18N, 330°), F_2 (10N, 090°) and F_3 (25N, 180°) act on a body at rest. Find, correct to one decimal place, the magnitude and direction of the resultant force.

This question was standard as it involved finding magnitude and direction. More than 50% of the candidates scored more than half of the mark and above. However, 8% scored zero.

SECTION B

Answer **four** questions **only** from this section, with **at least one** question from **each** part.

PART I

PURE MATHEMATICS

Question 9

- (a) Simplify: $\frac{1}{1 - \cos \theta} + \frac{1}{1 + \cos \theta}$ and leave the answer in terms of $\sin \theta$.
- (b) Find the equation of the joining the stationary points of $y = x^2(x - 3)$ and the distance between them.

The(a)part of the question was simple. It involved simplification by finding the lowest common denominator and then changes the cosine in terms of sine using the trigonometric identity.

The (b) part of the question was very technical and demanding. It required the following: differentiation, finding of points, finding of gradients, equation of the line and finding distance between the two points. As a result of that, only 10% of the candidates attempted. Of those who attempted, less than 5% manage to score some points.

Question 10

- (a) If $f(x) = \frac{2x-3}{(x^2-1)(x+2)}$,
- (i) Find the values of x for which $f(x)$ is undefined;
- (ii) Express $f(x)$ in partial fraction.
- (b) A circle with centre $(-3, 1)$ passes through the point $(3, 1)$. Find its equation.

The (a) (i)part of the paper was simple. It required equating the denominator to zero and solving. However, about 35% of those candidates who attempted this part of the question scored full mark and 15% scored zero.

The (a) (ii) part of the question was standard. It required expansion and equating as well as solving to get the correct expansion. About 7% scored full marks and more than 90% of those candidates who attempted this part of the question failed to write the correct partial expansion.

The(b) part of the question was simple and it required finding the radius and forming the equation. Most candidates (about 90%) who attempted this part of the question were unable to provide the correct radius and so they were not able to form the correct equation.

Question 11

- (a) If $f(x) = \int (4x - x^2) dx$ and $f(3) = 21$, find $f(x)$.
- (b) The second, fourth and eighth terms of an Arithmetic Progression (A. P.) form the first three consecutive terms of a Geometric Progression (G. P.). The sum of the third and fifth terms of the A. P. is 20.

Find the:

- (i) first **four** terms of the A. P.;
- (ii) sum of the **first** ten terms of the A. P.

The(a) part of the question was standard and is attempted by only 30% of the candidates. It required integration and finding the constant c to get the correct function. Only 10% of those candidates who attempted this part of the question scored full mark.

The (b) (i) part of the question was standard. It required finding the first term **a**, and the common difference d, and finally uses the formula to calculate the answer. More than 90% of those candidates who attempted this part of the question failed to state the correct method to the answer and as a result of that, they lost the whole point.

The (b) (ii) part of the question was also simple as it required the use of formula. Most candidates (about 80%) of those who attempt this part of the question were able to follow the right method and so were able to at least get the method mark.

PART II

STATISTICS AND PROBABILITY

Question 12

- (a) In a school, the ratio of those who passed to those who failed in a History test is 4:1, if 7 students are selected at random from the school, find, correct to **two** decimal places, the probability that:
- (i) At **least** 3 students passed the tests;
- (ii) Between 3 and 6 students failed the test.
- (b) A fair die is thrown **five** times, find the probability of obtaining a six **three** times.

The (a) (i) part of the question was simple and attempted by 50% of the candidates. It requires finding the sum of the binomial probability of those failing and then subtracts this from 1 to get the answer.

About 85% of the candidates who attempted this part of the question managed to score some points but less than 2% of the candidates got the full mark.

The (a) (ii) part of the question was also straightforward. It required finding the sum of the binomial probability of the fourth and sixth students. However, the majority of the candidates (about 90%) performed badly.

The (c) part of the question was also straightforward. It involved finding the correct binomial probability and solving. Here also, the majority of the candidates (about 95%) could not interpret this part of the question correctly.

Question 13

The table shows the frequency distribution of the ages of patients in a clinic.

Age (years)	17 – 19	20 – 22	23 – 28	29 – 34	35 – 43
No. of patients	6	9	12	18	18

- (a) Draw a histogram for the distribution.
 (b) Find, correct to **two** decimal places, the mean age of the patients.

This question was straightforward as it required a frequency density table for finding the frequency density and class boundaries for drawing a histogram and estimating the mean. Hence, about 95% of the candidates who attempted this part of the question were unable to draw a correct graph because they were unable to use the right labeling: frequency density against class boundaries/class midpoint.

PART III

VECTORS AND MECHANICS

Question 14

- (a) A body P of mass q kg is suspended by two light inextensible strings AB and DB attached to a horizontal table.

The strings are inclined at 30° and 60° respectively to the horizontal and the tension in AB is 48N. If the system is in equilibrium:

- (i) Sketch a diagram to represent the information.
 (ii) Calculate the tension in DB ;
 (iii) Find the value of q .
 (Take $g = 10 \text{ ms}^{-2}$)

- (b) A ball is thrown vertically upwards with a velocity of 20 ms^{-1} . Find, correct to **two** decimal places the:

- (i) Maximum height reached by the ball;
 (ii) Time taken to reach the maximum height.
 (Take $g = 10 \text{ ms}^{-2}$)

The(a) (i)part of the question was simple. It required a well labeled diagram. Most of the candidates (about 90%) who attempted this part of the question demonstrated a good understanding of the sketch.

The (a) (ii) part of the question was also simple. It required resolution of forces and solving the equation for the tension and finding mass **qkg**. Hence, about 55% of the candidates who attempted this part of the question displayed a good understanding of the question and were able to score some marks.

The (b) part was straightforward. It involved finding the distance and time. About 80% of the candidates who attempted this part scored the full mark.

Question 15

(a) Given that $\mathbf{m} = (6\mathbf{i} + 8\mathbf{j})$ and $\mathbf{n} = (8\mathbf{i} + \frac{7}{3}\mathbf{j})$, find the:

(i) Magnitudes and directions of \mathbf{m} and \mathbf{n} ;

(ii) Angle between \mathbf{m} and \mathbf{n} .

(b) The position vectors of P, Q, R, S are $\begin{pmatrix} -2 \\ 3 \end{pmatrix}, \begin{pmatrix} 10 \\ 4 \end{pmatrix}, \begin{pmatrix} 3 \\ 12 \end{pmatrix}$ and $\begin{pmatrix} 4 \\ 0 \end{pmatrix}$ respectively. Show that \overrightarrow{PQ} is perpendicular to \overrightarrow{RS} .

The (a) part of the question was standard. It involved finding the magnitude and direction of \mathbf{m} and \mathbf{n} and the angle between them. Although most candidates (about 75%) knew the correct method of finding the magnitude and direction but the majority of them (about 58%) failed to demonstrate the correct convention of direction in three digits and the degree of accuracy.

The (b) part of the question was also straightforward. It involved finding vectors \overrightarrow{PQ} and \overrightarrow{RS} and then showing that the dot product of the two was nothing but zero which implied that

$\theta = 90^\circ$ and finally concluding that they were perpendicular. About 85% knew how to find the two vectors and to state that their dot product was zero. However, most of them (about 80%) failed to conclude.

SCIENCE SECTION

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
THE SCIENCES

1. STANDARD OF THE PAPERS

The Science subjects for WASSCE include General Science, Physics, Chemistry, Biology, Health Science, Agricultural Science and Physical Education. The chief examiners unanimously reported that the standard of the papers compared favourably with those of the previous years. The rubrics were clearly stated and the marking schemes were stout and comprehensive.

2. CANDIDATES' PERFORMANCE

Candidates recorded poor performance in Physics 2 and Physics 3 Alternative B, Physical Education 2, Health Science 3, Biology 2 and 3, Chemistry 2 and Chemistry 3 Practical alternative A, Agricultural Science 2 and 3 and Science 2 and 3 respectively.

However, candidates showed some improvement in Physics Practical Alternative A, Physical Education 3 Performance test, Health Science 2 and Chemistry 3B Practical alternative B.

3. CANDIDATES' STRENGTHS

The chief examiners for the Sciences reported candidates' strengths as follows:

- Presenting work in tabular form;
- Calculating through logical steps;
- Ability of candidates to reproduce definitions;
- Legible presentation of work;
- Some candidates exhibited the ability to draw good diagrams, drawing and plotting of graphs and evaluation.

4. CANDIDATES' WEAKNESSES

Candidates showed some weaknesses in:

- Violation of rubrics;
- Accuracy;
- Omission of units;
- Lack of in-depth knowledge of the topics covered by the syllabus;
- Inability to explain, list and define or state common physical principles;
- Poor handwriting;
- Problem involving calculation;
- Interpreting the questions correctly;
- Spelling of scientific terms.

5. SUGGESTED REMEDIES

The chief Examiners suggested the following as remedies:

- Interpreting the questions correctly prior to answering;
- Additional emphasis should be placed on problem solving exercise;
- Candidates should properly study the question, carefully take note of the rubrics and operative principles before attempting them;
- Candidates should be familiar with definitions and precautions under each practical observed or conducted.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS REPORT
AGRICULTURAL SCIENCE 2

1. GENERAL COMMENTS ON THE PAPER

This year's questions for this paper were standard. The overall performance of the candidates however, was below expectation which could be attributed to several factors such as, schools not embarking on excursions, schools not having gardens among other factors.

The Majority of the candidates did not understand basic instructions and could not spell words properly. This is because most of the candidates were deficient in English language. Candidates did not know how to present their answers well. Teachers' needs to train their students as to the way they should approach questions. Questions number one and six were two of the most popular questions that candidates have attempted. These questions were drawn from general agriculture and agricultural economics respectively. About 70% of the candidates chose these questions. Almost half of the candidates who have attempted these questions scored at least half the marks allocated to these questions.

Notwithstanding this, the overall performance of the candidates who have offered the subject scored below the average pass mark. About 40% of the overall candidates got above 50% of the pass mark. Therefore, the Ministry of Basic and Secondary Education, Parents, teachers, WAEC and stakeholders needs to collaborate to improve the situation.

2. CANDIDATE'S STRENGTHS

The candidates were able to:

- List some non-governmental agricultural organizations in West Africa.
- State the ways in which agriculture and industry are interrelated.
- State four disadvantages of animal power.
- State the factors that should be considered in choosing an irrigation system in West Africa.
- Mention problems associated with irrigation in West Africa.

3. CANDIDATES' WEAKNESSES

Many candidates were unable to:

- Draw a well labeled diagram of the water cycle.
- Mention some deficiency symptoms of phosphorus in crops.
- Discuss maize smut disease under the following headings;
 - (i) Casual organism
 - (ii) Mode of transmission
- Discuss anthrax disease
- Give four reasons why agricultural insurance is important.

4. **SUGGESTED REMEDIES**

- The ministry should revisit the curriculum as against contact hours allocated for Science and even go extra mile to consider recommending it as a core subject across the country and to create the enabling environment in order for the teachers to be able to cover the syllabus.
- Schools should embark on excursions to Agricultural institutions and commercial farms to widen their scope of understanding in Agriculture.
- The usage of standard teaching and learning materials (teaching Aids).
- School Administration should also monitor the work of Agricultural science teachers.

5. **DETAILED COMMENTS ON THE INDIVIDUAL QUESTIONS**

Question 1

- a) List **five** Non-Governmental Organisations in West Africa.
- b) State **four** ways in which agriculture and industry are interrelated.
- c) Give **one** function of each of the following part of the disc plough:
 - (i) disc
 - (ii) Beam
 - (iii) Disc scraper
 - (iv) Hitch
- d) State four disadvantages of animal power.

Question one a was a popular question. About 90% of the candidates attempted this question. All the candidates scored half the required marks allocated to this question. However, quite a good number of the candidates were giving acronyms of these NGOs for example WARDA, IITA, IFARD etc. This method of answering question did not earn the candidates any mark. Also common to their answers were FAO, WHO AND WFP. These are United Nations Organisations and not nongovernmental organizations in West Africa.

The interrelationship between agriculture and industry was also fairly answered by the candidates. Most of them got the answers well. They both compete for labour.

They gave answers like:

- Agriculture provides food for industrial workers;
- Industry processes agricultural products;
- Agriculture provides raw materials for industry;
- Industry provides agrochemicals for farmers etc.

This great performance of the candidates may be as a result of relevant materials given to the students by their teachers, excursions made to industries, and teachers covering part of the prescribed syllabus.

The functions of part of the disc plough was poorly answered. About 80% of the candidates gave abstract answers. It can be noticed from the scripts of the candidates that most of the teachers avoid teaching this part of the syllabus. On the contrary, the disadvantages of animal power was moderately answered.

About, half of the total number of the candidates who have registered for this paper scored at least half of the marks allocated to this question. Most of the candidates gave answers which attracted marks from the marking scheme. They gave answers like:

- The animals can be fatigued;
- Animal power is not 100% efficient;
- The animals can eat up the crop;
- The animals cannot work under harsh weather conditions.

Question 2

- a) State **five** factors that should be considered in choosing an irrigation system in West Africa.
- b) Mention **four** problems associated with irrigation in West Africa.
- c) A rectangle-shaped farmland has a length of 0.4Km and a breadth of 240m. Calculate the area of the farmland in hectares' d. List one primary tillage and three secondary tillage implements.
- d) List one primary tillage and **three** secondary tillage implements.

The factors to consider in choosing an irrigation system in West Africa is a common question. Most of the candidates understood what the question demanded them to do. About 65% of the candidates were able to answer this question well. Candidates gave brilliant answers like topography, type of crop to be grown, type of soil in the area, e tc. The only common point that did not earn them any point was temperature.

The problems associated with irrigation in West Africa was also fairly answered. Most of the candidates scored half of the total marks allocated to question (2) b. I believe the good performance of the candidates was as a result of the students attitude of reading extensively.

The calculation of the area of the farmland in hectare however, was badly answered. About 87% of the total number of candidates who attempted this question got it completely wrong. Most of the candidates did not know how to convert Kilometers to meters. Also, some candidates gave answers without units. This method of answering questions should be discouraged by teachers and school administration.

Owing to this, Candidates didn't know what primary and secondary tillage implements were. Most of them gave hoe, cutlass, pick axe, rake etc as primary tillage implements. Others gave plough, tractor, power tiller etc as secondary tillage implements. This question was expected to be answered thus:

Plough and harrow, ridger, cultivator etc as primary and secondary tillage implements respectively.

Question 3

- a) *Draw a well labeled diagram of the water cycle.*
- b) *Mention two deficiency symptoms of phosphorus in crop.*
- c) *Classification of insects based on their mouth parts.*
 - (i) *weevil;*
 - (ii) *locust;*
 - (iii) *scale insect;*
 - (iv) *army worm;*
 - (v) *earworm;*
 - (vi) *cotton stainer;*
 - (vii) *green spidermites;*
 - (viii) *thrips;*
 - (ix) *capsids;*
 - (x) *yam beetle*

Question number (3) was the most unpopular question of this year's Agricultural Science paper 2. Candidates had no idea as how to draw the water cycle or the processes involved in the water cycle. A few of the candidates who stated the processes failed to indicate any arrow to show which process was leading to what in what they were trying to show. This way of answering questions is frowned upon by the marking scheme. The symptoms of phosphorus deficiency in crops was averagely answered.

Question 4

- a) *Discuss maize smut disease under the following headings:*
 - (i) *causal organism;*
 - (ii) *mode of transmission;*
 - (iii) **two** *symptoms;*
 - (iv) **two** *cultural control measures.*
- b) *Enumerate **four** forest management practices in West Africa.*
- c) *(i) State **four** classes of farm animals based on their uses.*
*(ii) Give **one** example of example of **each** class stated in 4(c) (i).*

Question number was another question that was woefully answered. Most of the candidates state dmaize smut disease as a viral disease instead of a fungal disease. This earned them no mark. The symptoms of maize smut diseasewas well spelt out. About 54% of the candidates gave galls on the leaves which was expected from the candidates. However, quite a good number of them gave answers like low yield, yellow of leaves etc. This is not the right approach to this question. The cultural control method of the maize smut disease was fairly attempted. Some of the candidates used the knowledge of disease control in plants.

The classes of plant protein were also not well answered. The way candidates arranged their answers manifested that they had no idea about this question at all. This question was expected to be answered thus.- calopogonium, centrosema, stylosynthes e.c.t.

Question 5

a) Discuss anthrax disease under the following headings

(i) causal organism

(ii) mode of transmission

(iii) two symptoms

(iv) two preventive and control measures

b) (i) List four sources of plant protein in livestock feeds.

(ii) Give three examples of forage legumes that could be found in rangelands in West Africa.

d) Mention five characteristics of labour as a factor of agricultural production.

The causal organism of the anthrax in animals is a bacterium. However, most of the candidates wrote virus. Candidates had a problem of giving correct spellings of bacteria. The mode of transmission, symptoms and the preventive and control measures were also clearly given out by almost all the candidates. Candidates used their general understanding on the disease control measures in farm animals.

However, about 71% of the candidates left question number (5) b) unattempted. This may be as a result of not covering the prescribed syllabus extensively. Candidates have to build up the culture of reading to enable them widen the scope of understanding in agricultural science.

On the other hand, the characteristics of labour as a factor of production is another area where candidate's performance was outstanding. About 60% of the candidates gave answers that were accepted. Some of the answers that earned them points were as follows:

- The reward of labour is salaries and wages
- It is geographically mobile
- It has feelings
- It can appreciate and depreciate
- It is variable asset etc
- This question gave an easy ride to most of the candidates. Candidates find it easy to answer the characteristics of labour as a factor of production.

Question 6

(a) Explain briefly each of the following basic economic concepts:

(i) scarcity;

(ii) scale of preference.

(b) Give four reasons why agricultural insurance is important.

(c) State five fishery regulations in West Africa.

(d) Give five reasons why beekeeping is important

Question number six was not well answered. It is only number six (d) that candidates scored all the marks allocated to this sub question. Most of the candidates used their understanding on the importance of agriculture to a nation. Candidates applying their general knowledge is very good. This should be encouraged by Agricultural Science teachers.

For the economic concepts, agricultural insurance and fishery regulations in West Africa were woefully answered. Candidates defined the scale of preference and scarcity without the technical terms required. About 78% of the candidates left 6 (B) unattempted. This area of the question is a new topic in the revised syllabus of the prescribe syllabus.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
AGRICULTURAL SCIENCE 3

1. GENERAL COMMENTS

The Agricultural Science Paper 3 (Practical) was in four sections of four (4) different questions from specific areas of Agriculture. This paper was considered to be of average standard by all examiners. It was very straight forward and there were no ambiguities. The success of the candidates were noticed in question 1, 2 and 4, while question 3 had many failures. Therefore candidates found questions 1, 2 and 4 to be within their competence while question 3 proved to be very difficult for them.

2. CANDIDATES' STRENGTHS

The candidates exhibited their strengths in questions 1, 2 and 4 which dealt with plant nutrients, farm tools and implements and animal science respectively.

Most of the candidates were able to answer most parts of these questions very well. A good number of them were able to list the names of the plant nutrients and uses of wood ash and cow dung in question 1. For question 4, the majority of the candidates were able to mention the economic importance of a chicken egg and methods of preserving fresh fish.

3. CANDIDATES' WEAKNESSES

The weaknesses of the candidates were many and show a strong correlation to poor understanding of some specific topics of the Agricultural Science Syllabus. Additionally, majority of the candidates did not fully understand the questions asked.

For some, the wrong specimens provided by their schools misled them to giving wrong answers. Lack of understanding on how to write botanical names, using the binomial system of Nomenclature, poor handwriting, terrible spelling errors, ignorance of breeds of poultry birds and poor understanding of the questions asked contributed to many candidates failure to answer many questions and spaces left blank in answer scripts.

4. SUGGESTED REMEDIES

It was expected that nearly all the candidates would emerge with very high scores. It was rather unfortunate that most of them performed poorly. A better performance can be expected from the recommendations below for students, teachers, schools and W.A.E.C.

- Students should be encouraged to study comprehensively and follow the recommended syllabus and text books.
- Students should be encouraged to improve their spelling abilities
- Students should know the common names breeds of farm animals, botanical names of crops and animals in West Africa.
- Teachers should be encouraged to cover the prescribed syllabus before candidates sit for their WASSCE examination.
- Teachers should acquaint students with binomial system of Nomenclature of

writing names of crops and animals.

- Teachers should incorporate practical Agricultural Science examination in their respective schools for candidates to get used to from grades 10 through 12.
- Teachers should expose students to the new method of question setting by WAEC that is, answering past questions of previous years.
- Schools should employ competent, experienced and qualified University graduates to teach Agricultural Science in Senior Secondary Schools.
- Schools should maintain well equipped Agricultural Science laboratories.
- Schools should have an agricultural farm with small animals and vegetable gardens to teach practical agriculture.
- Schools should organise field trips, excursions for students to visit farms, Agro service centres and agricultural processing projects.
- Schools should stock modern and relevant agricultural text books in their school laboratory.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

Question 1

Study specimens E, F, G and H and answer the following questions.

(a) (i) State three major nutrients supplied to crops by specimen E. About 70% of the candidates did well.

(ii) List three methods that could be used to apply specimen E on a farm. 60% of the candidates answered correctly.

(b) State three agricultural uses of each of specimens F and G. The candidates seem not to understand the questions and were giving non-agricultural uses of the specimens. 40% of the candidates answered correctly.

(c) Mention three ways in which specimen it is important to the soil.

The first part of question one consisted of identifying the three major nutrients supplied to crops by a complex fertilizer and three methods of applying the same fertilizer on a farm. The second part dealt with the agricultural uses of wood ash, limestone and importance of cow dung to the soil. About 50% of the candidates were able to answer this question correctly.

Question 2

Study specimens I, J, K and L carefully and answer the following questions.

(a) (i) Given two uses each of specimen I and J.

70% answered correctly for specimen I

10% answered correctly for specimen J.

(No: Many candidates confused specimen J which is a file, an agricultural tool to mean office stationery file).

- (ii) *State two general ways of maintaining specimen S, I and J. 40% answered correctly.*
- (b) (i) *Give the botanical names of the crops from which each of specimens K and L were obtained from. About 5% answered correctly.*
- (iii) *Outline the steps involved in the traditional method of producing specimen K. Many of the candidates did not state the steps of the procedure in an orderly manner and using the right agricultural terminology and were consequently penalised.*

Question 2 the first part covered identification and maintenance of simple farm tools and equipment in Agriculture. The second part covered mentioning the correct botanical names of crops and how to extract oil using traditional method of an oil crops. About 40% of the candidates listed some or most of the steps.

Question 3

Study specimens P, Q and R and answer the following questions.

1. (a) (i) *State three effects of Aphid on crops.*
30% answered correctly.
- (ii) *Mention two ways of controlling specimen P.*
30% answered correctly.
- (b) (i) *Give two benefits of including the crop from which specimen Q was obtained in a mixed cropping system.*
20% got it right.
- Name the major storage pest of specimen Q.*
10% answered correctly.
- (c) *State five uses of specimen R.*
70% answered it correctly.
- (e) *Give the botanical names of the crops from which specimens Q and R were obtained.*

Question 3 covered effects of a specific pest on crops, ways of controlling such pest, benefit of introducing a legume in a mixed cropping system. Other parts of this same question 3 dealt with identifying a major pest of a legume, the correct botanical names of crop. Only 10% of candidates answered this question correctly.

Question 4

Study specimens T and U and answer the following questions.

- (a) (i) *Name three breeds of the farm animal which produces specimen T.*
5% answered correctly.
- (ii) *State four ways in which specimen T is economically important.*
90% answered correctly.
- (b) (i) *Mention two methods of harvesting specimen U from the panel.*
40% answered correctly.
- (ii) *List two by-products that could be obtained from the processing of specimen U.*
50% of candidates answered correctly.
- (iii) *State four methods of preserving specimens U.*

Question 4 was an animal science question concerning identification of breeds of layers in poultry production, economic importance of chicken eggs. The second part of the question dealt with methods of harvesting fish from ponds, mentioning by-products that could be obtained from fish and methods of preserving such harvested fresh fish. 90% of candidates answered it correctly.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
BIOLOGY 2

1. GENERAL COMMENTS

The standard Biology paper 2 this year compared favourably as those of the previous years. The questions were within the scope of the syllabus for Biology, designed for the West African Senior Secondary Certificate Examination (WASSCE). The overall performance of the candidates was below average. Some candidates performed excellently; showing that they had prepared very well and probably covered about 95% of the topics in the syllabus with their teachers. 70% of the candidates however performed poorly; indicating that they do not have the right attitude towards the subject or were not really well prepared for the examination. The overall performance of the students in Biology Paper 2 was very discouraging; worse than previous years.

About 45% of the candidates could hardly understand the questions asked; leading to the writing of wrong answers for those questions that were misunderstood. Candidates should learn to read each and every question carefully, try to understand it very well before attempting to answer it. Every question must be read at least twice before attempting to answer it.

2. CANDIDATES' STRENGTHS

- Ability of most candidates to reproduce definitions
- Ability of most candidates to follow instructions
- Legible presentation of work by most candidates

3. CANDIDATES' WEAKNESSES

- Poor level of preparation and lack of basic knowledge
- Failure to answer the required number of questions.
- Wrong spellings of biological/scientific terms
- Re-copying of question as answers
- Answering questions from Section B which is for only meant for candidates in Ghana
- A good number of the candidates found it difficult to present their ideas in simple English.
- Inability of most candidates to draw biological diagrams and label them correctly.

4. SUGGESTED REMEDIES

- Teachers must teach constantly using the prescribed syllabus and not just rely on pamphlets and past questions. There are a lot of topics in the syllabus where questions have never been drawn. It is therefore necessary that teachers check the syllabus as they teach to identify such topics and draw questions from them for tests and examinations.
- Teachers should not only focus on teaching the subject matter but also train students how to answer questions by giving them more of practice work and revising test and examination questions with them.
- Strategies should be developed to encourage more students to offer Science Subjects.

- Teachers should lay much emphasis on spellings of scientific terms, names and concepts by giving spelling tests to students. When they are aware that they are to be graded, they will take it seriously.
- Schools should have a well-equipped Biology Laboratory to facilitate and enhance the teaching/learning of Biology.
- Qualified teachers should be employed in both Public and Private schools to teach; Biology.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

Question1

- (a) (i) *What is classification of living things?*
 (ii) *Name the scientist that developed the Binomial System of Classification.*
 (iii) *State three reasons why it is necessary to classify living things.*
 (iv) *List seven major groups into which taxonomists classify living things in order hierarchy.*
- (b) *State two features each which viruses have in common with:*
- (i) *living;*
 (ii) *non-living things.*
- (c) *Name two viral disease each of:*
- (i) *plants;*
 (ii) *humans.*

In question 1(a)(i) candidates were expected to explain what classification of living things means. About 70% of those who attempted question 1 answered this part correctly; while others were giving answers such as “classification is the classifying of living things”; thus failing to score marks. In 1(a)(ii) about 50% of the candidates failed to correctly spell the name of the scientist that developed the binomial system of classification. Some were using small letters to start spelling the name, thereby losing marks. About 60% of the candidates failed to correctly state the reasons why it is necessary to classify living things. Some of them gave reasons such as “classification is necessary to know the phylum, family etc. About 70% of the candidates who attempted 1(a) (iv) correctly listed the seven major groups. Those who could not gain any marks were as a result wrong spellings of the names of the groups.

In 1(b), not more than 30% of the candidates scored half of the marks allocated to this question. They completely lack knowledge of the features of viruses as living thing and as non-living thing. A good number of them stated the general characteristics of living things and the opposite for non-living things.

In 1(c), about 95% of the candidates who attempted this question scored all the marks allocated to it. Some didn’t score any marks because of wrong spellings of the names of the plant and human viral diseases. The general performance of the candidates in question was slightly above average and almost 90% of the candidates attempted it.

Question 2

- (a) *State four characteristics of enzymes.*
- (b)
 - (i) *List two digestive enzymes produced in the duodenum of humans.*
 - (ii) *Name the substrate that each enzyme listed in 2(b)(i) acts on.*
 - (iii) *State the products of each enzyme activity in 2(b)(ii)*
- (c)
 - (i) *State one way in which chlorophyll is important in plants.*
 - (ii) *Name two macroelements that are required for the formation of chlorophyll in plants.*
 - (iii) *State one deficiency symptom of each macroelement named in 2(c)(ii).*
- (d) *Outline the procedure used for testing for starch in a leaf.*

Question 2 was attempted by about 90% of the candidates and their performance was slightly above average. In question 2(a), 80% of the candidates scored high marks, the remaining 20% did not gain good marks because they totally misunderstood the question and some failed to write some formulae correctly; e.g. pH was written as PH. Another example is that some of them wrote things such as “enzymes speed up the rate of chemical reactions instead of biological reactions.

In 2(b) candidates performed well by listing the two digestive enzymes in the duodenum of humans, naming the substrate on which each of the enzymes act and the products of their activities. Some of them could not score good marks because of failure to spell the names of the enzymes correctly, the substrates they act upon and the product of their activities. E.g., Amylase was spelt as amilace or trypsin spelt as tripsin etc.

In 2(c) was correctly answered by about 80% of the candidates. They were able to state the importance of chlorophyll in plants, name the macro elements that are required for formation of chlorophyll in plants and state the deficiency symptoms of each macro element.

In 2(d) was poorly answered by about 75% of the candidates. They failed to follow the procedure used for testing for starch in a leaf. E.g. candidates put boiled leaf in 70% of warm alcohol. Candidates lost marks for failing to write warm.

Question 3

- (a) *Name one instrument used for collecting:*
 - (i) *soil organisms from a soil sample;*
 - (ii) *tiny insects from a leaf or a stem,*
- (b) *Make a diagram 6 cm – 8 cm long of the instrument named in 3(a)(ii) and label fully.*
- (c) *Explain briefly the relationship between three examples of symbiotic organisms.*

This question was not attempted by 90% of the candidates and even those who chose to do it performed poorly. Some were getting 0 out of 20 marks.

In 3(a) (i) and (ii), over 90% of those who attempted the question were unable to correctly name the instruments for collecting soil organisms from a soil sample and for collecting tiny insects from a leaf.

In 3(b) the diagram of the pooter was almost an impossible task for those who chose to do this question. Those who managed to draw a structure like a pooter could not label it correctly, thus losing marks.

In 3(c), about 30% of those who attempted this question got half of the mark allocated to this particular question as they were able to briefly explain the relationship between three examples of symbiotic organisms. Some of them however did not write any answer to this aspect of the question; indicating that there wasn't proper coverage or treatment of the topic. The general performance of candidates in this question was very poor

Question 4

- (a) *A child belongs to blood group O and the mother belongs to group B. With the aid of a genetic cross, state the possible blood groups of the father.*
- (b)
 - (i) *Name two forms of adaptive communication in animals.*
 - (ii) *State two reasons why organisms communicate with one another.*

Question 4 was also not popular with the candidates as only about 20% opted for it. The grades ranged from 0 to 5 out of 20 marks. The genetic crosses in 4(a) were poorly done. In fact only about 5% of the candidates who attempted this question scored 2 or 4 marks for this part of question 4. Some candidates chose the question but wrote nothing at all. The performance was generally poor for the entire question 4. This is also a clear indication that this topic was not properly treated with the candidates.

Question 6

- (a) *Explain briefly the process of perceiving smell in humans.*
- (b) *State the adaptive features of the egg of a domestic fowl.*
- (c)
 - (i) *What are autotrophs?*
 - (ii) *Name two unicellular organisms that are autotrophs.*
- (d) *State five functions of the World Health Organization.*
- (e) *Name two examples each of plants and animals that live in a freshwater pond.*
- (f) *In a tabular form, state five differences between the skin of a mammal and the epidermis of a leaf.*
- (g) *A farmer has two plots of land; plots A and B. On plot A, the farmer planted several seeds of maize. On plot B, the farmer planted several seeds of maize and pepper in a small area. What type of competition would be observed on:*
 - (i) *plot A;*
 - (ii) *plot B?*

In this question, about 40% of the candidates scored half of the mark allocated to it; that is 15 out of 30 marks. About 10% of them scored between 20 and 25 out of 30 marks.

In 6(a), 20% do not understand the question and answered it wrongly; based on their own knowledge. Instead of outlining the process of perceiving smell, they were stating the causes of smell. E.g. not taking bath three times a day, not wearing clean clothes etc.

6(b) was also poorly answered by most of the candidates as they were unable to state the adaptive features of the egg of the domestic fowl. Some were stating the adaptive features of the fowl. They were stating such as possession of feathers for flight, possession of shell only; leaving out porous shell and the absence of the word “porous” will not gain any mark. The function must correspond with structure to score marks.

6(c) (i) was well answered by about 80% of the candidates but 6(c) (ii). The failure to spell the names of the organisms correctly made them to lose marks. A few of them tried to name them correctly.

In 6(d), about 30% of the candidates misunderstood the functions of WHO for the Ministry of Health. E.g. they were stating such things as “WHO provides hospitals and clinics in all parts of the country which is a function of the Ministry of Health.

In 6(e), most of the candidates tried to name the examples of each of plants and animals that live in a fresh water pond but fail to score marks because of wrong spellings of the names. Another reason was that they failed to know that aquatic habitat is divided into fresh water and marine water. Therefore, they named generally aquatic plants and animals instead of freshwater plants and animals.

6(f) was totally misunderstood by about 40% of the candidates. A good number of them gave the general differences between a mammal and a plant instead of basing it on the differences between a mammalian skin and the epidermis of a leaf. E.g. the leaf is green and the mammalian skin is not green, the skin has hair and the epidermis does not have hair etc.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
BIOLOGY 3 (PRACTICAL)

1. GENERAL COMMENTS

Biology 3(Practical) was made up of three well-structured questions. These questions were up to the standard of senior secondary school biology syllabus. They were short answer-essay questions without ambiguity.

Four main topics in the syllabus were carefully targeted and tested:

- i). **Phylum Arthropoda**, with particular reference to four examples from the Class Insecta: butterfly, grasshopper, cockroach, mosquito and the larva of butterfly (caterpillar) in questions 1 and 2.
- ii). **Phylum Annelida** with reference to the earthworm in question 4
- iii). **Storage organs** with particular reference to an example of a root tuber (carrot) and a stem tuber (Irish potato) in question 2.
- iv). **Simple fruits** with an example of a drupe (unripe mango) and berry tomato) in question 4.

A thorough knowledge on these four main topics would have perfectly prepared the candidates to perform well in this examination.

The general performance of candidates for this examination was not satisfactory at all compared to previous examinations. It is rather disheartening to observe from this marking exercise that, the same mistakes for which candidates have been penalized in previous exams were still committed by these candidates. The general performance can roughly be rated as shown by the ranges of marks and their percentages:

Mark ranges	Percentages
50 to 55	5%
49 to 30	15%
29 to 10	25%
09 to 05	35%
00 to 04	20%

This performance is due to some weaknesses and strengths manifested by candidates as shown below:

2. CANDIDATES' WEAKNESSES

- Poor spelling of scientific terms
- Wrong writing of taxonomic terms. Taxonomic terms must always start with a capital letter. E.g. Arthropoda, Annelida, Insecta
- In stating structural adaptations, structure must always go with function to score e.g. Chaetae for movement. The structures mentioned should be observable using the naked eye or hand lens.
- In stating differences between two specimens, the differences must tally or match to score

- In most cases differences and similarities should be observable as it may be indicated in the question.
- Poor diagrams. Quality diagrams with details are needed to score high marks.
- Pupils do not take their time to do diagrams as specified in the question. Candidates draw diagrams without title, magnification and not fully labeled.
- Poor hand writing.
- Poor expressions in English Language.
- Not answering questions in the correct order.
- Poor preparation for the examination shown by a lot of candidates scoring zeros.

3. **CANDIDATES' STRENGTHS**

- Fairly good ability to express themselves in English Language.
- Few exhibited the ability to draw good diagrams.
- Few had the ability to spell technical words correctly.
- Fairly good preparation for the examination.

4. **SUGGESTED REMEDIES**

- Candidates must prepare well for this examination by having appropriate text books
- Teachers must endeavour to give practical lessons more frequently together with the theory lessons.
- Teachers must expose pupils to past practical questions with preserved or freshly collected specimens
- The use of photocopy diagrams for practical work can be very deceitful because candidates need to observe the real specimens in their natural forms.
- Teachers must endeavour to go on field trips for the students to see some of these specimens in their natural habitats
- Principals must ensure that the Chief Examiners report is made available to biology teachers who are not examiners.
- Teachers must also include frequent spelling tests in their assessments. This can greatly help to improve their skills in spelling scientific words.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

Question 1

Study specimens C, D and E carefully and answer questions 1 (a) to 1(e).

(a) (i) *Name the phylum to which specimens C and E belong*

(ii) *State two reasons for the answer in 1(a) (i).*

(b) *State three observable structural differences between the following specimens:*

(i) *C and D*

(ii) *C and E*

- (c) What is the relationship between specimens C and D?
- (d) (i) Name the habitat of Specimen D
(ii) State two ways in which specimen D is adapted to its habitat
- (d) Make a drawing 8 cm to 10 cm long of the dorsal view of specimen C and label fully.

1 (a). (i) Phylum of specimen C/Butterfly and specimen/grasshopper

Phylum Arthropoda

Some wrong answers included: Athropoda, arthropoda, arthropods, annelid, Lepidoptera.

Taxonomic terms always start with a capital letter. This made some candidates to lose marks for this question.

(ii). Reasons for answer in 1(a) (i)

- Metameric segmentation/segmented bodies
- Jointed appendages
- Presence of chitinous exoskeleton/exoskeleton made up of chitin
- Bilateral symmetry

Some wrong answers candidates wrote included:

- Jointed legs/many jointed legs
- Have three pairs of legs
- Have three body divisions(head, thorax and abdomen)

(b).i). Differences between specimens C and D

C/ Butterfly	D/caterpillar
Wings present	Wings absent
Proboscis present	Mandibles present
Proleg absent	Proleg present
Legs are longer	Legs are shorter
Claspers are absent	Claspers are present
Has one pair of compound eyes	Has simple eyes
Has antennae	Antennae absent
Osmeterium absent	Osmeterium present

ii). Differences between specimens C and E

Butterfly/c	Grasshopper/E
Presence of proboscis	Presence of mandibles
Clubbed/knobbed antennae	No clubbed/knobbed antennae
Wing is membranous /soft	Wings are harder/less membranous/leathery
Surface of wings is powdery/scaly with eye spots	Surface of wings are notpowdery/absence of scale /eye-spots
Wings are pigmented/colourful	Wings have uniform colour/green/brown
Smaller/shorter hind limbs or legs	Longer/larger and elongated or more muscular hind limbs/legs
Hairy abdomen	Smooth abdomen

Comments:

i). Most students do not still know how to write down structural differences. Most students wrote down structures that are not observable. e.g. Specimen C stands with the wings vertically raised while specimen E stands with the wings horizontally. Specimen C feeds on citrus fruits while specimen E feeds on grasses,

ii). Most of the differences written did not tally or match and therefore did not score any mark.

E.g. Specimen c has clubbed antennae while specimen E has muscular hind legs

(C). Relationship between Specimen C/butterfly and specimen D/ Caterpillar

C/Butterfly is the adult stage/imago of specimen D/caterpillar or

D/ caterpillar is the larva/larval stage of specimen C/ Butterfly

Some wrong answers written by candidates included:

- D is the stage in the metamorphosis or life cycle of C
- They all form the animal kingdom
- Both belong to the animal kingdom
- Both are segmented
- They are related by pollination of flowers

d) (i) Habitat of specimen D: Garden/citrus leaves/vegetables/leaves/fruits**(ii) Adaptation of specimen D/caterpillar to its habitat**

- Mandibles for chewing
- It has three pairs of true legs with claws for locomotion
- It has claspers for attachment to vegetation/twig
- Presence of four pairs of pro-legs for climbing
- Its coloured pattern enables it to blend with its environment/camouflage/escape predators
- Has spiracles for gaseous exchange
- Has simple eyes for vision
- Has osmeterium as defence mechanism/which emits foul smell to scare away Predators

Comments

In this type of question, it should be noted that structure goes with function to score. Most candidates just listed down the structures without writing down the function.

e) Diagram of dorsal view of specimen C/butterfly

Drawing diagrams is a serious problem to most students. Diagrams usually score a lot of marks(10 marks) out of 25 marks for the whole question 1. Each diagram drawn should have some specifications to indicate the quality and details of the diagram. Some of these specifications are as follows:

Title of diagram: Diagram of dorsal view of specimen C/ Butterfly and NOT Diagram of butterfly/specimen C

Quality (Q)

Clarity of lines: The drawing lines must not be wooly, thick or broken but smooth and Thin

Size: The size of the diagram must not be less than 8 cm and not more than 10cm long

Neat labels: Ruled guide lines and horizontal labels.

Magnification: $\times 1/2$ to $\times 11/2$ (It should not be less or more than 2.5. Magnification has no unit such as 2.5cm)

Details:

Clubbed antennae (CA)

Three body division (TD)

Forewings broader than hind wings

Labels: Head, compound eye(s), forewings, hind wings antenna, abdomen, scale/eye spot
About 90% of students scored very low marks for this diagram because they did not show these qualities and details of the diagram.

Question 2

Study specimens F and G and answer the questions 2(a) and 2(b)

(a) State three observable features of biological importance in :

(i) specimen F, (ii) specimen G

(b) (i) Classify specimens F and G as either stem tuber or root tuber

(ii) Give two reasons each for the answer in 2(b) (i)

Study specimens H and J and answer questions 2(c) to 2 (e).

(c) Classify specimens H and J into the class to which both belong.

(d) (i) State four observable differences between specimens H and J

(ii) State four observable similarities between specimens H and J

(e) (i) State the feeding habits of each of specimens H and J

(ii) Name two observable features used for feeding in specimen J

(a) Observable features of biological importance in ;

Specimen F/carrot

- Main tap root/swollen root/root tuber
- Presence of lateral roots
- Presence of short stem(green)
- Presence of foliage leaves
- Part of main root tapering

Specimen G/irish potato

- Swollen stem/stem tuber
- Presence of buds/eyes
- Lenticels
- Scale leaves
- Adventitious roots

(b) (i). Classification of specimen F and G

Specimen F/carrot is a root tuber

Specimen G/Irish potato is a stem tuber

ii). Reasons for classification

Specimen F/carrot is a root tuber because:

- Presence of swollen tap root
- Presence of lateral root
- Presence of reduced stem(above the swollen tap root)

Specimen G is a stem tuber because:

- Presence of swollen stem /tuber
- Presence of buds or eyes
- Presence of scale leaves
- Presence of lenticels

Comments: The candidates needed some knowledge on the study of stems and roots in flowering plants. The features found in these structures are found in root tubers and stem tubers that are storage organs. Even when students were just to choose, which of these structures was either a root tuber or a stem tuber, 50% of candidates did not score for this question. Let us assume the question was to classify these two specimens. May be very few would have identified F as a root tuber and G as a stem tuber.

(c) Classification of specimens H and J

Both belong to the class Insecta **NOT** insecta/insect/annelida

(d) (i) Observable differences between specimen H and J

Specimen H/adult mosquito	Specimen J/adult cockroach
Smaller in size	Bigger in size
Has a pair of wings	Has two pairs of wings
Absence of hard hind wings	Presence of hard hind wings
Has shorter antennae	Has longer antennae
Proboscis present	Mandibles present
Absence of maxillary palp/maxilla	Presence of maxillary palp/maxillae
Body is cylindrical	Body is dorso-ventrally flattened
Has thin legs	Has thick/large legs
Absence of spine on legs	Presence of spines on legs

(ii) Similarities between specimens H and J

- Presence of a pair of compound eyes/compound eyes
- Body divided into head, thorax and abdomen/three divisions
- Have three pairs of (walking) legs
- Presence of jointed appendages
- Presence of a pair of membranous wings/wings
- Presence of a pair of antennae
- Both have exoskeleton made up of chitin have segmented bodies

Comments:

Some students wrote similarities that were abstract and therefore could not score such as:

- Both of them are insects
- Both of them can fly

(e) (i) Feeding habits of specimens H and J

Specimen H: Piercing and sucking

Specimen J: Biting and chewing

Most students could not score here because of the two operating words were not paired up.

(ii) Observable features used for feeding in specimen J/cockroach

Mandible, maxillae, labrum, labium

This was poorly done. 50 % of candidates were not able to score for this part of the question (e)I&ii

Question 4

Study specimen R and answer questions 4 (a) to 4 (c).

(a) (i). Name the phylum of specimen R

(ii) State two reasons for your answer in 4(a) (i)

(iii) State the habitat of specimen R

(b) (i) State two structural features that adapts specimen R to its habitat

(ii) State three ways in which specimen r is of economic importance

(c) **Make a drawing 8 cm to 10 cm long of the dorsal view of specimen R and label fully.**

Study specimens S and T and answer the questions 4(d) to 4(e).

(d) What type of fruits are specimens S and T?

(e) (i) State four observable differences between specimens S and T

(ii) State three observable similarities between specimens S and T.

(a). i). Phylum of specimen R/ Earthworm: Annelida and **NOT** annelida/anelida/Anelida

ii). Reasons for classification of Earthworm as Annelida

- Presence of metameric segmentation/segmented body
- Bilaterally symmetrical
- Presence of chaetae
- Body covered with thin cuticle
- Body is long and cylindrical

iii). Habitat of specimen R/Earthworm

- Under decaying leaves
- Wet and moist soil
- In open savannah beneath the tall grasses
- In the forest in decaying tree stumps

(b). i). Features of adaptations of specimen R/earthworm

- Bristle-like chaetae/seatae for locomotion
- Moist skin for gaseous exchange
- Pointed anterior for burrowing in the soil
- Slimy body reduces friction during movement
- Clitellum for attachment during exchange of sperms /reproduction /secretes cocoon(in which its eggs are deposited)

It must be noted here also that structure and function must correspond to score. Most candidates only listed down the structures without their function and therefore could not score any mark.

(ii). Economic importance of specimen R/Earthworm

- It aerates the soil
- It enriches the soil/improves soil fertility
- Its secretions neutralizes the soil acidity
- Used as bait for fishing
- Used as food for birds and other animals

Some wrong answers given included:

- It damages crops
- It decomposes the soil

(c). Diagram of the dorsal view of specimen R/Earthworm:

For the diagram to score good marks, the diagram should be given a title, details of diagram, qualities and must be fully labeled as in question 1. Ten (10) marks were awarded for this diagram for which most candidates scored below 5 marks because of poor quality and detailed diagram.

(d). Type of fruits

Specimen S/mango fruit was a **drupe** and not dupe/drup/unripe mango

Specimen T/tomato fruit was a **berry** and not bery/ bary/tomato

(e) (i) Differences between Specimens S/mango and specimen T/Tomato

Specimen S/Unripe mango fruit	Specimen T/ tomato fruit
Green in colour	Red/yellow in colour
One seeded	Many seeded
Has large seed	Seeds are smaller
Fibrous mesocarp	Succulent mesocarp
Basal placentation	Axile placentation
Stony or hard endocarp	Flashy/soft/succulent endocarp
Mesocarp and endocarp are fused	Mesocarp and endocarp are not fused.

It must be noted that each of the differences should tally or match otherwise it cannot score

ii) Similarities between specimen S and specimen T

- Both have seeds
- Both are fruits
- Both have three layers (epicarp, mesocarp and endocarp)
- Coloured epicarp/pericarp
- Both have placenta
- Both have thin epicarp
- Both have fleshy mesocarp

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
CHEMISTRY 2

1. GENERAL COMMENTS

The standard of the paper was quite appropriate for the level of the candidates. The questions selected covered a very wide range of topics across the syllabus. The rubrics were clear and without ambiguities. The marking scheme was detailed and flexible in its interpretation to accommodate the various answers provided by candidates. The performance of candidates generally was not impressive and do not vary much in comparison to the previous examination. However, very few candidates scored zero mark. But equally so, few candidates scored above 50 marks. Majority of marks were below 50 out of a total of 100 marks.

2. CANDIDATES' STRENGTHS

Candidates' performances were remarkable in the following areas:-

- Understanding the questions set.
- Using a logical approach to answering questions.
- Giving the required details to questions requiring descriptive answers.
- Recalling definitions of terminologies.
- Candidates answered questions according the instruction given, ie they did not attempt the questions set for candidates in Ghana

3. CANDIDATES' WEAKNESSES

Candidates' weaknesses were expressed in the following areas:-

- Ignoring the use of key words and expressions in defining terminologies.
- Recalling appropriate words in answering certain questions.
- Understanding and applying the steps in writing chemical symbols of atoms and ions and formulae of compounds correctly.
- Writing balanced chemical equations correctly.
- Doing calculations using the required formulae, or first principle.
- Some candidates answered more than the four questions required and this could have affected their performance, as time needed to answer relevant questions was reduced.

4. SUGGESTED REMEDIES

Improvement in candidates' performance in subsequent examinations can be enhanced by considering the following suggestions:-

- Familiarising with the syllabus and its contents.
- Adequately revising all the topics in the different sections of the syllabus, rather than few selected topics.

- Interpreting the questions correctly before answering.
- Be aware of the marks allocated to each question and be guided by the marks to provide the required answer(s).
- Revising past examination papers thoroughly while preparing for this paper.
- Understanding the principles related to mathematical concepts and how each is applied in doing calculation.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

- (a) (i) *What is an acid-base indicator?*
 (ii) *Give one example of an acid-base indicator.*

Most candidates obtained part of the total marks allocated to this question. Few candidates were able to define an acid- base indicator correctly. Almost all the candidates gave a correct example of an acid-base indicator.

- (b) *State the property exhibited by nitrogen (IV) oxide in each of the following equations:*
 (i) $4\text{Cu} + 2\text{NO}_2 \rightarrow 4\text{CuO} + \text{N}_2$;
 (ii) $\text{H}_2\text{O} + 2\text{NO}_2 \rightarrow \text{HNO}_3 + \text{HNO}_2$.

Most of the candidates could not interpret this question correctly, or did not recall the answer to the question.

- (c) (i) *Define enthalpy of combustion.*
 (ii) *State why the enthalpy of combustion is always negative.*

Most candidates could not recall the correct definition of standard enthalpy of combustion. Some candidates gave the correct explanation for why the *standard enthalpy of combustion* has a negative value.

- (d) (i) *Distinguish between a primary cell and a secondary cell.*
 (ii) *Give an example of **each** of the cells stated in I (d) (i).*

(d)(i),(ii) Most candidates scored part of the total mark allocated to this question by distinguishing a primary cell from a secondary cell and give correct example of each. Few candidates jumbled up their answers.

- (e) *Define the term mole.*

Most candidates failed to correctly define the term mole..

(f) Calculate the amount of hydrochloric acid in 40.0 cm^3 of 0.40 mol dm^{-3} dilute HCl .

Most candidates could not tackle the calculation of the number of moles of hydrochloric acid using the information provided.

(h) Name **two** substances which can be used as electrodes during the electrolysis of acidified water.

Most candidates were able to mention at least one correct material used as an electrode in the electrolysis of acidified water.

(h) List **two** forces of attraction that can exist between covalent molecules.

Majority of the candidate mentioned at least one of the forces of attraction between covalent molecules.

(i) Name the products formed when butane undergoes incomplete combustion.

(a) Most candidates mentioned at least one correct product for the incomplete combustion of butane.

(b) Most of the candidates could not write the correct electron configuration for the iron(III) ion.

Question 2

(a) (i) I. State the periodic law.

II. What is meant by the term periodic property of elements?

(ii) List **three** properties of an element which show periodicity.

(iii) Explain **briefly** how **each** of the properties listed in 2 (a) (ii) varies across the period.

The Majority of the candidates answered this question, having at least six out the thirteen marks allocated. Some candidates could not state the periodic law correctly, or define a periodic property. While it was evident that most of the candidates could recall periodic properties, it was difficult to explain the trends across the period for the properties mentioned.

(b) Define relative atomic mass

(b) This part was answered correctly by only few candidates. Most of the candidates who attempted this question, gave an incorrect definition of relative atomic mass.

- (c) (i) What phenomenon is exhibited by an element Which exists as
- (ii) What accounts for the difference in the mass numbers of the element..?
- (iii) Calculate the relative atomic mass of..... if the percentage abundance of

(c) (i),(ii),(iii) Most of the candidates failed to mention the word 'Isotopy' in referring to the phenomenon exhibited by chlorine atoms. Some candidates explained the reason for the difference in mass number between the isotopes correctly. Majority of the candidates calculated the percentage abundance and relative atomic mass of chlorine correct

- (d) (i) State the method used for collecting each of the following gases:
- I. CO_2 ;
- II. HCl ;
- III. H_2 .
- (ii) Give a reason for your answer stated in 2 (d)(i) I and 2 (d)(i) II.
- (d)(i) ,(ii) Majority of the candidates gave the correct method of collection of at least two of the gases and the correct the method named.

Question 3

- (a) Consider the following reaction equation:
- $\text{C}_{12}\text{H}_{26}$
- (i) What type of reaction is represented by the equation?
- (ii) Write the molecular formula of X.
- (iii) Draw the structure of two isomers of X.
- (v) Write a balanced equation for the reaction between X and hydrogen

- (a) (i) Majority of the candidates attempted this question and were able to mention that the reaction was *cracking*, but they could not score the mark allocated because the key word 'catalytic' was omitted in their answer.
- (ii) majority of the candidates answered this question.
- (iii), (iv). most candidates drew the correct structural formulae and gave the correct IUPAC name for each of the isomers of the compound. Some candidates lost marks because they could not draw the structure of the compounds correctly.
- (v) very few candidates wrote the correct balanced equation for the hydrogenation reaction of the compound.
- (b) Describe **one** test for fats.

Only few candidates were able to score the total marks allocated to this question. Even though majority of the candidates described the test for fats correctly, yet only few could give the correct observation from the test and resulted in loss of marks.

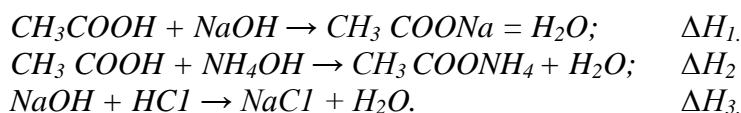
- (c) Sulphur (IV) oxide is converted to tetraoxosulphate (VI) acid according to the following equation:
- $$2\text{SO}_{2(g)} + \text{O}_{2(g)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{H}_2\text{SO}_{4(aq)}.$$

If 1.5 moles of oxygen reacts with sulphur (IV) oxide, calculate the mass of tetraoxosulphate (VI) acid produced.

[H = 1.0; O = 16.; S = 32.0]

Most candidates attempted this question and scored part of the total mark allocated. There was a misinterpretation of the question by majority of the candidates. It was also evident that most candidates could not tackle calculations correctly.

(d) *Consider the following neutralization reactions:*



Majority of the candidates attempted this question. There was evidence of either lack of understanding, or knowledge of the question resulting in a wide range of answers. Candidates who scored part of the mark were able to state the correct order of the reactions in terms of their enthalpy values. However, they could not explain correctly the reasons for the order.

(e) *Consider the following substances.*

*$\text{Cu}_{(s)}$, $\text{BeCl}_{2(s)}$, $\text{NaH}_{(s)}$, $\text{HF}_{(l)}$ and $\text{CCl}_{4(l)}$.
State the substance(s) which:*

- (i) *can conduct electricity;*
- (ii) *is/are soluble in water.*

Majority of the candidates attempted this question and scored at least 1 mark out of the total mark allocated. Candidates guessed their answers most cases, resulting in a loss of mark.

Question 4

- (a) (i) *Define hybridization.*
- (ii) *With the aid of an appropriate diagram, indicate how the C=C double bond in an alkene is formed.*

Most candidates recalled the process of making ammonia. Some candidates however, were able to describe the steps involved correctly by stating the correct reactants and products, as well as, the correct conditions. Few candidates described the laboratory preparation of ammonia, which was not required.

(ii) most candidates wrote the equation for making ammonia correctly. There were errors in writing the correct state symbols and the reversibility sign.

(iv) few candidates mentioned the correct way of increasing the yield of ammonia.

- (iv) most candidates mentioned at least one correct use of ammonia
- (b) (i) *State Faraday's first law of electrolysis.*
(ii) *State **two** applications of electrolysis.*

Generally, this part was poorly answered by most of the candidates and marks scored were not encouraging. It was evident that most candidates could recall the tests for hydrogen, oxygen and carbon (IV) oxide. However, the answers were merely description of facts rather than the steps involved in the test for each of the gases.

- (c) (i) *Calculate the enthalpy change (ΔH) at 25 °C for the reaction:*
 $C_2H_{4(g)} + 3O_{2(g)} \rightarrow 2CO_{2(g)} + 2H_2O_{(l)}$.

Use the information provided in the table below.

compound	$C_2H_{4(g)}$	$CO_{2(g)}$	$H_2O_{(l)}$
ΔH°_f / kJmol ⁻¹	+52.3	-393.5	-286.0

- (ii) *State whether the reaction is endothermic **or** exothermic.*
(iii) *Give a reason for your answer in 4(c) (ii).*

This part was poorly answered by majority of the candidates. Very few candidates provided answers which suggest their lack of understanding of the composition and uses of water gas.

- (d) *Given the equilibrium system at 25 °C:*
 $2SO_{3(g)} \rightleftharpoons 2SO_{2(g)} + O_{2(g)}$. $\Delta H = 198 \text{ kJ}$
- (i) *Write equilibrium constant, K_c expression.*
(ii) *State the effect on K_c at the **instant** when concentration of SO_3 is increased.*
(iii) *What would be the effect on the concentration of SO_2 after equilibrium is re-established at 25 °C when:*
I. *temperature is increased?*
II. *pressure is increased?*
(iv) *Explain your answers in 4 (d)(iii) I and 4 (d)(iii)II.*
- (e) *Explain Briefly the term hemolytic fission and give an example.*

Most candidates demonstrated an understanding of the question, but their answers suggest a misinterpretation of the question.

Question 5

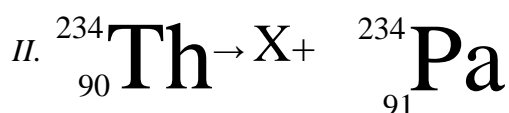
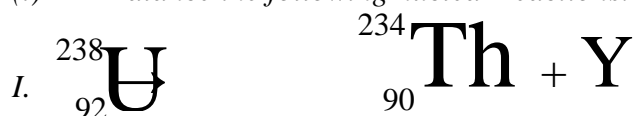
- (a) (i) *What is the nature of **each** of the following radiations?*
I. *Alpha.*
II. *Beta.*
III. *Gamma.*

(ii) *State two factors that determines the stability of a nuclide.*

This part was not well answered by majority of the candidates. There was ample evidence to suggest that the question was well understood and candidates were familiar with the facts about the test for the trioxonitrate (V) ion. However, very few candidates scored 1 , or 2 marks out of the total marks allocated.

(ii) Majority of the candidates gave at least one correct use of both sodium chloride and sodium trioxocarbonate (IV). Some candidates jumbled up their answers.

(b) (i) *Balance the following nuclear reactions.*



(ii) *Identify X and Y*

(b)(i) Few candidates scored part of the marks allocated to this question because they could write some of the equations for the reactions which occur in the blast furnace. Most candidates failed to write the correct formulae of either reactants or products in most of the reactions.

(iii) *Identify X and Y.*

(ii) most of the candidates could not state Faraday's first law of electrolysis correctly.

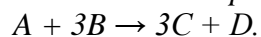
(iii) most candidates gave the correct applications of electrolysis.

(c) (i) *Give **two** similarities between nuclear reactions and chemical reactions.*

(ii) *State **two** uses of radioactive nuclides.*

(c) most candidates misunderstood this question. There was much evidence of misunderstanding of this question by most of the candidates. The answers given suggest that most candidates interpreted the question as a test for starch.

(d) Consider the reaction represented by the following equation:



The initial rate of the reaction was measured using different concentrations of A and B. the results are shown in the table below.

Exp.	[A] mol dm^{-3}	[B] mol dm^{-3}	Rate ($\text{mol dm}^{-3} \text{ s}^{-1}$)
I	0.100	0.100	5.40×10^{-4}
II	0.200	0.100	4.32×10^{-3}
III	0.200	0.200	4.32×10^{-3}

Most candidates attempted this question, but few of them wrote at least one of the two equations required correctly.

(e) Very few candidates answered this question correctly.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
CHEMISTRY 3ALTERNATIVE A

1. GENERAL COMMENTS

The standard of the paper was appropriate for the level of the intended candidates. It was of a parallel standard to those of previous years. The general performance was not very satisfactory and it was quite obvious that majority of the candidates could not put much effort due to lack of knowledge in the subject area.

Apart from a few candidates (less than 10%) who displayed a very poor sense of understanding in some questions, most of them could show much evidence of diligence in their approach towards the subject. There was abundant evidence that the poor performance was due to:

- Incomplete coverage of the syllabus.
- Inadequate knowledge in the course content.
- Low level of preparedness for the examination.
- Lack of understanding of fundamental concepts and principles.

2. CANDIDATES' STRENGTHS

There is a remarkable improvement in the following areas:

- Writing in INK
- Attempting all the questions
- Presenting work in tabular forms
- Calculating through logical steps
- Clarity and legibility of work done
- Presenting precise answers to questions

3. CANDIDATES' WEAKNESSES

The poor performance of candidates could be attributed to the following areas:

- Misinterpretation of questions
- Inability to follow instructions
- Lack of facts and reasons in answers provided
- Common spelling mistakes
- Incomplete coverage of the examination syllabus
- Lack of effort and adequate preparation for the examination
- Inability to express themselves clearly in simple language
- Insufficient practice/use of laboratory apparatus or chemicals
- Poor understanding of important practical concepts or terminologies
- Supplying inferences for which **no** or **incorrect observations** were made
- Inability to use appropriate terminologies e.g. precipitate instead of residue

- Performing wrong tests such as:
- **Residue** + $\text{NaOH}_{(aq)}$ or residue + $\text{NH}_3_{(aq)}$.
- **A** + distilled water (where **A** represents the **ACID**).
- **C** + $\text{NaOH}_{(aq)}$ instead of solution **C** or $\text{C}_{(aq)}$.
- **C** + $\text{NaOH}_{(aq)}$ (where **C** is a mixture of two salts or substances) instead of $\text{C}_{(aq)}$ or solution **C** + $\text{NaOH}_{(aq)}$.

4. SUGGESTED REMEDIES

- Early and continuous work be done on practical.
- Additional emphasis should be placed on problem solving exercises.
- Candidates should ensure a wider and in-depth coverage of the syllabus.
- Candidates should endeavour to prepare adequately for the examination.
- Candidates should properly study the questions, carefully take note of the rubrics and operative principles before attempting them.
- Candidates must have obtained very good grades in mathematics and science in their Junior Schools before offering chemistry at higher levels.
- Workshops and/or seminars be organized by WAEC so that Chief Examiners could educate teachers and students alike as to what is required of them in a chemistry practical examination.
- Laboratory practical activities should be done right across the three years of Senior Secondary School (i.e. Grade 10, 11 and 12) rather than compressing all the practical work in Grade 12.
- *The Chief Examiner **must** attend all preliminary coordination meetings for the standardization of the marking scheme and to help lay emphasis on the fact that all samples used in qualitative analysis **must** be pre-tested before the administration of the examination.*
- The Report Form must be filled **completely** by the teacher responsible for providing the materials and enveloped along the candidates answer scripts to aid the marking of the table in question 1.
- *It is interesting to note that **most** of the Report Forms did not indicate whether the candidates used 20 cm^3 or 25 cm^3 pipette.*
- The Chief Examiner should be given the opportunity and find time to organize Workshops for Chemistry Teachers across the country to brief them on the salient points required for the Chemistry 3 (Practical) Paper.
- *This among other things would eliminate the presentation of **inconsistent** or **non-concordant** titre values supplied by Teachers on the Report Form.*
- *This problem was clearly observed in one of the centres in which the Teacher presented his titre values as 30.50 cm^3 , 44.95 cm^3 and 41.10 cm^3 and to worsen the situation, calculated the average of the three as 86.58 cm^3 .*

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

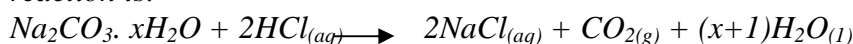
Question 1

A is 0.200 moldm^{-3} of HCl

C is a solution containing 14.3 g of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ in 500 cm^3 of solution.

- (a) Put A into the burette and titrate it against 20.0 cm^3 or 25.0 cm^3 portions of C
(b) using methyl orange as indicator. Repeat the titration to obtain **consistent** titre values.

Tabulate your results and calculate the average volume of A used. The equation for the reaction is:



- (c) From your results and the information provided, calculate the:

- (i) concentration of C in moldm^{-3} ;
(ii) concentration of C in gdm^{-3} ;
(iii) molar mass of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$.
[H=1.0; C=16.0; Na=23.0]

This question was generally well attempted. Over 60% of the candidates scored more than half of the total marks allocated.

In (a), candidates were able to:

- present of burette readings in tabular form with consistent titre values;
- record burette readings to two decimal places;
- supply correct units to burette readings,
- average consistent titre values.

Vital marks were, however, lost because few candidates **failed** to:

- complete the table correctly;
- supply unit or correct unit to their tables;
- state the average volume to two decimal places;
- supply the correct units to their final average volume;
- calculate the volume of acid used in the titration;
- calculate the average volume using consistent titre values;
- state burette readings to a possible degree of accuracy. In which case, the *secondburette readings* should either be a **zero** or **five** like 24.00 or 24.05 and **not** 24.01, 24.02 or 24.08 cm^3 .

In (b) (i), few candidates failed to:

- use the correct mole, substitute correctly and change subject correctly in calculating the concentration of C, the base, in mol dm^{-3} ;
- calculate the correct molar mass of Na_2CO_3 ;
- supply the correct unit of the molar mass of Na_2CO_3 ;
- state their final numerical answers to **three significant figures**.

In (b) (ii), many candidates obtained the maximum marks but a few of them lost vital marks because they **failed** to:

- supply correct units to their final numerical answer;
- state their final numerical answers to **three significant figures**;

In (b) (iii), vital marks were lost by candidates due to their inability to:

- calculate the correct molar mass of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$,
- supply the correct unit of the molar mass of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$;
- state their final numerical answers to **three significant figures**.

In (b) (iv), a few candidates lost vital marks because they **failed** to:

- Calculate the value of x correctly;
- State the value of x to the **nearest whole number**.
- In simple terms, the value of x is calculated by summing up all the atomic numbers in the chemical formula, $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ and equating it to the calculated molar mass as follows:
 $-(23 \times 2) + 12 + (16 \times 3) + 18x = \text{calculated molar mass in (b) (iii) above.}$

Question 2

F is a mixture of two inorganic salts. Carry out the following exercises on *F*.

Record your observation and identify any gas(es) evolved. State the conclusions you draw from the result of **each** test.

- (a) Put all of **F** in a beaker and add about 10 cm³ distilled water. Stir well and filter.
Keep the filtrate and the residue.
- (b) (i) To about 2 cm³ of the filtrate, add $\text{NaOH}_{(\text{aq})}$ in drops and then in excess.
- (iii) To another 2 cm³ portion of the solution, add $\text{NH}_3_{(\text{aq})}$ in drops and then in excess.
- (c) To another 2 cm³ portion of the solution, add a few drops of $\text{HNO}_3_{(\text{aq})}$ followed by few drops of $\text{AgNO}_3_{(\text{aq})}$
- (d) (i) Put all the residue into a clean test tube and add $\text{HNO}_3_{(\text{aq})}$
- (iii) To a portion of the solution from 2(d)(i) add $\text{NaOH}_{(\text{aq})}$ in drops and then in excess.

Attempt at this question was encouraging. Many candidates were able to display skills of real Chemical knowledge. The orderly presentation of tests, observations and inferences is worthy of commendation.

However, vital marks were lost by most candidates because they:

- failed to adhere to instructions and carry out tests as stated in the question;
- recorded wrong or incomplete observations;
- stated wrong or incomplete inferences;
- wrote wrong symbol of ions or gas e.g. CL^- , CU^{2+} , cu^{2+} , Co_2 , etc.

It's worth noting that teachers should endeavor to tell students:

- to record their observations and state the corresponding inferences as soon as the tests are made;

- to state more than one possible/correct ion as inference for some observations;
- that any wrong ion stated under the inference column leads to a penalty of **minus 1**;
- that the confirmatory test for CO_2 is not with litmus paper but with **lime water** where the lime water is turns milky.

Question 3

State what would be observed if the following reactions are carried out in the laboratory:

- (i) *methyl orange is dropped into a solution of lime juice;*
- (ii) *hydrogen sulphide gas a bubble through iron (III) chloride solution;*
- (iii) *sulphur (IV) oxide gas is bubble into acidified solution of KMnO_4 ;*
- (iv) *ethanoic acid is added to a solution of K_2CO_3 .*

This was the worst attempted question. It was clear that candidates performed poorly in this question due to the following reasons:

- Inadequate laboratory practice.
- Incomplete coverage of the syllabus.
- Lack of knowledge of subject matter.
- Low level of preparedness for the examination.
- Inability to report in principle learned practical concepts.

Correct and expected answers are:

- (a) (i) The solution turns pink/red.
- (iv) The FeCl_3 solution changes from brown/yellow to green with a yellow deposit.
- (iii) The purple/violet/mauve colour turns colourless or is decolourized.
- (iv) There is effervescence and a colourless, odourless gas is evolved.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
CHEMISTRY ALTERNATIVE B

1. GENERAL COMMENTS

The paper was of appropriate standard with adequate time allocated. The general performance was satisfactory. Over **40%** of the candidates were able to score at least 25 marks of the total allocated marks of 50.

Compared with previous years, this year's general performance improved. The questions were simple, straight forward and easy to understand and this, to a great extent has helped to improve candidates' performance. It seems as if the interest in the practical aspect of the subject is finally taking its rightful sit in the syllabus.

The overall impression created by this performance points to the fact that candidates have had considerable practical experiences. Students are no more taking practical lessons for granted having at the back of their minds that they are as equally important as their Essay and Objective papers (i.e. Chemistry 2).

2. CANDIDATES' STRENGTHS

Candidates showed commendable improvement in the following areas:

- Writing in INK.
- Clarity and legibility of work.
- Attempting all the questions.
- Using correct units to numerical answers.
- Presenting work in correct tabular forms.
- Recording burette readings to **two** decimal places.
- Averaging consistent/concordant titre values.
- Calculating through logical steps.

3. CANDIDATES' WEAKNESSES

The low performance level by candidates could be attributed to:
Stating wrong inferences.

- Misinterpretation of questions.
- Making incomplete or wrong observations.
- Lack of effort and adequate preparation for the examination.
- Failing to give numerical answers to 2 or 3 significant figures.
- Recording burette readings to an impossible degree of accuracy e.g. 16.77 cm³, 23.01 cm³, etc.
- Lack of knowledge of important practical concepts or terminologies e.g. precipitate instead of residue.
- Supplying inferences for which **no** or **incorrect observations** were made.
- Inability to use appropriate terminologies e.g. precipitate instead of residue.

- Performing wrong tests such as:

Residue + $\text{NaOH}_{(aq)}$ or residue + $\text{NH}_{3(aq)}$.

B + distilled water (where **B** represents the **ACID**).

E + $\text{NaOH}_{(aq)}$ instead of solution **E** or $\text{E}_{(aq)}$.

E + $\text{NaOH}_{(aq)}$ (where **E** is a mixture of two salts or substances) instead of $\text{E}_{(aq)}$ or solution **E** + $\text{NaOH}_{(aq)}$.

4. SUGGESTED REMEDIES

- Early and continuous work be done on practical.
- Additional emphasis should be placed on problem solving exercises.
- Candidates should ensure a wider and in-depth coverage of the syllabus.
- Candidates should endeavour to prepare adequately for the examination.
- Candidates should properly study the questions, carefully take note of the rubrics and operative principles before attempting them.
- Candidates should have obtained very good grades in mathematics and science in their Junior Schools before offering chemistry at higher levels.
- Workshops and/or seminars be organized by WAEC so that Chief Examiners could educate teachers and students alike as to what is required of them in a chemistry practical examination.
- Laboratory Practical Activities should be done right across the three years of Senior Secondary School (i.e. Grade 10, 11 and 12) rather than compressing all the practical work in Grade 12.
- *The Chief Examiner **must** attend all preliminary coordination meetings for the standardization of the marking scheme and to help lay emphasis on the fact that all samples used in qualitative analysis **must** be pre-tested before the administration of the examination.*
- The Report Form must be filled **completely** by the teacher responsible for providing the materials and enveloped along the candidates answer scripts to aid the marking of the table in question 1.
- *It is interesting to note that **most** of the Report Forms did not indicate whether the candidates used 20 cm^3 or 25 cm^3 pipette.*
- The Chief Examiner should be given the opportunity and find time to organize Workshops for Chemistry Teachers across the country to brief them on the salient points required for the Chemistry 3 (Practical) Paper.
- *This among other things would eliminate the presentation of **inconsistent** or **non-concordant** titre values supplied by Teachers on the Report Form. This problem was clearly observed in one of the centres in which the Teacher presented his titre values as 30.50 cm^3 , 44.95 cm^3 and 41.10 cm^3 and to worsen the situation, calculated the average of the three as 86.58 cm^3 .*

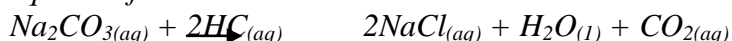
5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

B is a solution of hydrochloric acid.

D is a solution containing 2.45 g of anhydrous sodium trioxocarbonate (IV) in 250 cm³ of solution.

- (a) *Put B into the burette and titrate is against 20.0 cm³ or 25.0 cm³ portion of D using methyl orange as indicator. Repeat the titration to obtain consistent titre values. Tabulate your results and calculate the average volume of B used. The equation for the reaction is:*



- (b) *From your results and the information provided, calculate the:*

- (i) *concentration of D in moldm⁻³;*
- (ii) *concentration of B in moldm⁻³;*
- (iii) *concentration of B in gdm⁻³;*
- (iv) *volume of the gas evolved in the reaction at s.t.p.*
[H=1.0; C=12.0; Na=23.0; Cl=15.5. Molar Volume = 22.4 dm³ mol⁻¹]

Like in Alternative A, this question was well attempted. Over half of the candidates scored more than half of the total marks allocated.

In (a), candidates were able to:

- present tables of burette readings with consistent titre values;
- record burette readings to two decimal places;
- supply correct units to burette readings;
- average consistent titre values.

Vital marks were, however, lost because few candidates **failed** to:

- complete the table correctly;
- supply unit or correct unit to their tables;
- state the average volume to two decimal places;
- supply the correct units to their final average volume;
- calculate the volume of acid used in the titration;
- calculate the average volume using consistent titre values.

In (b) (i), many candidates obtained the maximum marks but a few of them lost vital because they **failed** to:

- correctly calculate the molar mass of Na_2CO_3 ;
- supply unit or correct unit to the molar mass of Na_2CO_3 ;
- state the concentration of **D** to **three significant figures** with the correct units.

In (b) (ii), few candidates **failed** to:

- use the correct mole, substitute correctly and change subject correctly in calculating the concentration of **B**, the acid, in mol dm^{-3} .
- state the concentration of **B** (in mol dm^{-3}) to **three significant figures** with the correct units.

- In (b) (iii), vital marks were lost by candidates due to their **inability** to:-calculate the correct molar mass of HCl .
- supply the correct unit of the molar mass of HCl .
- state the concentration of **B** (in gdm^{-3}) to **three significant figures** with the correct units.

In (b) (iv), few candidates **failed** to:

- determine the moles of the Na_2CO_3 before finding the volume of gas.

Question 2

E is a mixture of an organic compound and an inorganic salt. Carry out the following exercises on E.

*Record your observation and identify any gas(es) evolved. State the conclusions you draw the result of **each** test.*

- (a) *Put all of E in a boiling tube or beaker and add about 10 cm^3 of distilled water. Stir the mixture well and filter. Keep both the filtrate and residue.*
- (b) *To about 5 cm^3 of the filtrate, add about 2 cm^3 of Fehling's solution and warm.*
- (c)
 - (i) *To the residue, gently add about 5 cm^3 dilute HCl . Divide the solution into **two** portions.*
 - (ii) *To the first portion, add $NaOH_{(aq)}$ in drops and then in excess.*
 - (iii) *To the second portion of the solution, add $NH_{3(aq)}$ in drops and then in excess.*

Attempt at this question was more encouraging when compared the question 2 of Alternative A. Many candidates were able to display skills of real Chemical knowledge. The orderly presentation of tests, observations and inferences is worthy of commendation.

However, vital marks were lost by most candidates because they:

- failed to adhere to instructions and carry out tests as stated in the question;
- recorded wrong or incomplete observations;
- stated wrong or incomplete inferences;
- state the correct colour (i.e. brick-red) of precipitate formed when Fehling's solution was added to the filtrate (i.e. reducing sugar or glucose);
- wrote wrong symbol of ions or gas e.g. CL^- , CU^{2+} , cu^{2+} , Co_2 , etc.

Like in Alternative A, it's worth noting that teachers should endeavor to tell students:

- To record their observations and state the corresponding inferences as soon as the tests are made.
- To state more than one possible/correct ion as inference for some observations.
- That any wrong ion stated under the inference column leads to a penalty of **minus 1**.
- That the confirmatory test for CO_2 is not with litmus paper but with **lime water** where the lime water is turned milky.

Question 3

- (a) *Describe briefly one chemical test that used to differentiate between:*
- (i) *ethanol and prepare 1-01;*
 - (ii) *ethane and ethyne..*
- (b) *Give a reason for each of the following laboratory practices:*
- (i) *KMnO₄ solution is not acidified with HNO₃, before titration;*
 - (ii) *FeSO₄ solution is usually prepared fresh when needed;*
 - (iii) *Sodium metal is usually stored in liquid paraffin;*
 - (iv) *Alkalis are not stored in glass stoppered reagent bottles.*

This was the worst attempted question. The following points were evidently clear from this question.

- Inadequate laboratory practice.
- Incomplete coverage of the syllabus.
- Lack of knowledge of subject matter.
- Low level of preparedness for the examination.
- Inability to report in principle learned practical concepts.
- Neglect of certain aspects of the syllabus (particularly organic and inorganic).

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
HEALTH SCIENCE 2 (ESSAY)

1. GENERAL COMMENTS

The questions for the Health science ESSAY (Paper 2) was standard and the questions were within the scope of the syllabus set for the West African Senior secondary school certificate examination (WASSCE). The overall performance of the candidates was satisfactory. The candidates performed well in over 75 % of the syllabus were the questions were known from. The few candidates who were ill prepared represent a small percentage, who did not answer all the questions and as a result scored very low marks. Looking at the answers given by the candidates, it can be concluded that some candidates did not understand the questions asked. The candidates therefore need to read the questions thoroughly in order to understand what is required before answering it. The marking scheme was explicit, for candidate who prepared themselves well for the examination to score good marks. About 40% of the candidates scored good marks, 30% with average scores and the rest with poor marks. Some candidates were unable to express themselves in simple English whilst others have very scanty scientific/biological terminologies. Due to the above deficiencies most ideas were wrongly presented.

2. CANDIDATES' STRENGTHS

The candidates showed improvement in their ability to:

- give straight forward answers;
- state the digestive juices;
- state the factors that affect growth in humans;
- give a function of mouth and gullet;
- list pollutants that could be present in water fetched from a stream;
- mention the methods that could be used in the home to make stream water safe for drinking;
- mention the methods of domestic refuse disposal, their advantages and disadvantages;
- list the signs of fracture;
- state the human activities that affect the environment;
- state the ways by which water bodies are polluted;
- state the sources of family planning services;
- mention three sources of potable water supply;
- state the uses of water in human body.

3. CANDIDATES' WEAKNESSES

The candidates' weaknesses include their inability to:

- express ideas in simple english language;
- answer one question number on the same page;
- spell words and biological terms correctly;
- use terms correctly in a sentence;
- arrange ideas in a logical order;

- logically present their ideas;
- correctly write question numbers;
- give enough appropriate answers without repetition;
- legibly write their answers for examiners to read.

4. **SUGGESTED REMEDIES**

- Candidates should improve on their spelling skills.
- Basic scientific terms should be understood by the students.
- Candidates need to follow the instructions of each section of the paper.
- Teachers should endeavour to cover the syllabus.
- Candidates should understand the question before answering them.
- The school authority should monitor to ensure that the teachers adhere to their curriculum delivery plan.
- Teachers should read the chief examiners report in order to improve the candidates' skill of answering questions.

5. **DETAILED COMMENTS ON INDIVIDUAL QUESTIONS**

SECTION A

Question 1

(a) *Copy and complete the table below on minerals and nutrients.*

Name	(i) Source	(ii) One Deficiency
Phosphorus	-----	-----
Iron	-----	-----
Copper	-----	-----

(b) *One source and one deficiency of phosphorus, iron and copper.*

This question was well answered by 50% of the candidates. The candidates' problem was that, they wrote the same source and deficiency for all minerals. 10% of the candidates did not complete the table or left the columns empty without writing anything there or did not attempt it at all. A few candidates were just guessing and writing more than one source and deficiency.

b) *Name **four** digestive juices in humans.*

(b) *Digestive juices*

This question was well answered by 60% of the candidates. 20% of the candidates cannot correctly spell the names of the juices. 15% of the candidates were only naming enzymes in the digestive tract i.e. lipase, amylase, trypsin etc.

Question 2

(a) *Explanation of community health.*

This question was poorly answered by the candidates; only about 10% scored marks for this question. 40% of the candidates were explaining the meaning of health instead of community health.

(b) *State **three** characteristics of work place based on health.*

This was one of the worst attempted questions on this section. Only 10% wrote correct answers. Most of them were writing wrong answers like; sweeping the place daily, free from toxic substances, good health insurance for the workers etc.

Question 3

*State **four** factors that affect growth in humans..*

This question was well answered by 75% of the candidates. 10% were repeating themselves by writing answers such as lack of proteins, fats, vitamins and minerals as different points which all falls under the same answer nutrition scoring the same mark.

Question 4

What is Digestion?

This question was defined by 80% of the candidates but only 20% scored maximum points. Their definition was not exhaustive as they define digestion as 'the breaking down of food substance to simple soluble particles' thereby losing the remaining two marks.

Question 5

*Give **one**function **each** of the following organs*

- (i) *mouth;*
- (ii) *gullet;*
- (iii) *small intestines;*
- (iv) *large intestines.*

This question was well answered by 50% of the candidates. About 30 % of those who attempted this question had problem in writing the function of small and large intestines. A few of the candidates mixed the function of small and large intestines. The function of mouth and gullet was well answered by almost 80% of the candidates.

Question 6

*Mention **three** ways in which drugs are administered in humans.*

This question was answered by only 35% of the candidates. The remaining candidates were writing on the effects of drugs instead of ways drugs are administered in humans.

SECTION B

Question 7

- (a) (i) *What is pollution?*
(ii) *Name **four** pollutants that could be present in water fetched from a stream.*
(iii) *Describe **two** methods that could be used in the home to make stream water safe for drinking.*

7.(a)(i) The definition of pollution was wrongly answered by 40% of the candidates. Some of them defined it as the release of unwanted materials in the atmosphere.
(ii) 60% of the candidates correctly answered this question. 20% of those who did not score marks were listing organisms found in water as fish, insects, and leaves, sticks which are not pollutants of water. A few were repeating the same points as (i) faeces (ii) urine (iii) sewage all of which are sewage.
(iii) 80% of the candidates were able to score maximum points for this question. A few wrote wrong answers like decantation, distillation and sieving.

- (b) (i) *Explain why it is important to keep houseflies away from food?*
(ii) *State **one** method of domestic refuse disposal.*
(iii) *State **one** advantage and **one** disadvantage of the method named in 7 (b) (ii) above.*

- (b) (i) This question was well answered by 75% of the candidates, scored at least two marks out of three.
(ii) This was one of the best answered questions. 90% of the candidates scored maximum .
(iii) This question was also well answered by 75% of the candidates scoring maximum points.

- (c) *State **three** signs of a fracture.*

This question was well answered by 70% of the candidates scoring maximum points.

Question 8

- (a) (i) ***Explain** the term disaster.*
(ii) *State **five** human activities that affect the environment.*
(iii) *State **three** ways by which water bodies are polluted.*

(a)(i) The definition of disaster posed a big problem to the candidates. About 20% defined it correctly, while the rest defined it wrongly as destruction to an area or place.
(ii) This question was attempted by many candidates and about 60 % of the candidates were able to give correct answers. Some candidates repeated the same point which attracted a single mark. Example deforestation and over grazing; dumping of raw sewage and dumping of faeces/urine.
iii) This was well answered by the candidates. About 75% of the candidates were able to score maximum points.

(b) Explain the following techniques as used in family planning:

- (i) Spermicide creams;*
- (ii) Contraceptive pills;*
- (iii) Intra-uterine device.*

b) 30% of candidates who attempted this question did not write the correct definition of spermicide creams, contraceptive pills and Intra-Uterine Device (IUD). Most candidates used the word pregnancy instead of fertilization. Example spermicides prevent pregnancy instead of fertilization.

*(c) State **one** source of family planning services.*

c) 70% of the candidates who attempted this question scored all the points.

Question 9

This question was the least attempted on this section. Only 20% of the candidates attempted this question with 75% of them scoring less than half the mark.

- (a) (i) What is asphyxia?*
- (ii) Describe the First Aid treatment given to a victim of asphyxia.*

This question posed a big problem to the candidates. Only 5% of those who attempted this question defined it correctly.

70% of the candidates who attempted it were unable to acquire half the score.

- (b) (i) Mention **three** sources of potable water supply.*
- (ii) State **five** uses of water in the human body.*

b) (i) Almost all the candidates who attempted were unable to get the full score. 50% of them gave wrong answers as river, stream, ponds, lakes etc.

(ii) Only 30% of the candidates answered this question well. Others were stating domestic uses of water thereby losing all the points. Example use for washing, cooking, irrigation, drinking etc.

*(c) Give **five** examples of blood diseases in humans.*

c) Only 50% of the candidates who attempted this question scored half the points. The spellings of blood diseases posed a big problem to the candidates there by losing points. Most candidates wrote wrong answers as cancer, heart attack and cholera.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
HEALTH SCIENCE 3 PRACTICAL

1. GENERAL COMMENTS

The standard of the paper was the same as those of the previous years. The general performance was below average, even worse than last year.

Nevertheless, there were some excellent scripts from candidates that prepared for the examination. Based on the general performance, one can clearly conclude that majority of the schools did not complete the syllabus or were not well covered and as a result their candidates were unable to attempt most of the questions in paper 3.

Also based on answers that were given, it appeared that majority of the candidates interpreted the questions wrongly. Candidates must therefore learn to read, analyse and interpret each and every question before attempting to answer it.

The marking scheme was a bit flexible, compared to previous years, which gave room for candidates to earn good grades/marks.

2. CANDIDATES' STRENGTHS

Majority of the candidates did well in their attempt to answer questions 1, 2 and 3. About 60% of candidates were able to:

- adhere to stated instructions by answering all questions;
- identify the illustrated organ in the diagram in question 1(a)(i);
- Name the structures associated with the organ;
- mention the system that would be affected if the illustrated organ in question 1(a) is damaged;
- mention possible diseases that could affect the illustrated organ in question;
- identify the types of injury in diagrams A and B in question 3;
- mention the materials used in administering First Aid to the injured parts in question 3.

3. CANDIDATES' WEAKNESSES

The candidates weaknesses includes their inability to:

- interpret the questions correctly;
- to write legibly for examiners to read;
- express themselves well in English language.
- give correct scientific / biological names;
- number the questions;
- attempt all the questions as was required.

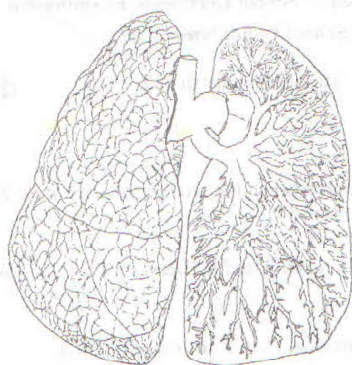
4. SUGGESTED REMEDIES

- Teachers should use the prescribed syllabus, endeavour to cover it and embark on revisions with their students.
- Teachers should be guiding the students on how to answer examination questions.
- Teachers and students should be motivated for better performance in Sciences.
- Teachers must try very hard to employ all types of teaching methodology.
- Schools should invest in appropriate teaching aids and equipments for quality teaching and learning.
- Principals' should make the syllabus to the disposal of teachers of various subjects, for better performance.
- Train and qualified teachers should be employed and well monitored.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

The diagram below illustrates an organ of a system in humans. Study it and answer questions 1(a), (b) and (c)



- (a) (i) *Identify the illustrated organ in the diagram.*
- (ii) *Name **two** structures associated with the illustrated organ.*
- (iii) *Mention the system that would be affected if the illustrated organ is damaged.*
- (b) (i) *Name **two** diseases that could affect the illustrated organ*
- (ii) *Mention **one** human habit that is dangerous to the illustrated organ.*
- (c) *State **two** human habits that could make the illustrated organ healthy.*

In question 1 (a) (i) 80% of the candidates identified the illustrated organ in the diagram as lungs but 30% with wrong or incomplete spellings such as Lung/Long etc. most of the candidates gave the answer to 1 (a) (ii). In some cases, the names were wrongly spelt eg. trache for trachea and branch for bronchi.

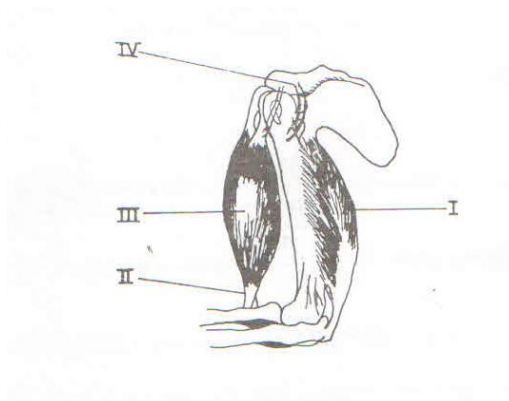
Only a few of them could spell the associated structures correctly. About 90% of the candidates identified the system that would be affected if the illustrated organ is damaged as the respiratory system, although few spell it wrongly eg respiratory for respiratory.

Less than 60% of candidates were able to name two (2) diseases of the lungs, mention human habits that could make the illustrated organ healthy, as was required in Q1 (b) (i), (ii) and 1 (c) respectively.

Question 2

The diagram below illustrate postures in humans.

Study the diagrams carefully and answer questions 2(a) 2(b) and 2(c).



(a) (i) Name the system illustrated in the diagram

CORRECT ANSWER

- Muscular system
- Musculoskeletal system

WRONG ANSWER

- Excretory system
- Appendicular skeleton

(ii) Name the parts labeled **I, II, III** and **IV**

CORRECT ANSWER

- I triceps
- II tendon
- III
- IV

WRONG ANSWER

- Triceps
- ligament
- biceps biceps
- ligament Trachea

Most of the candidates gave wrong spellings as shown above

(b) (i) Mention **four** injuries that could affect the part labelled **I**.

CORRECT ANSWERS

- Muscle tear/ muscle bruise
- Muscle strains/over stretching
- Muscle fatigue/Muscle cramp/Muscle spasm
- Muscle pull
- Burns/scars

WRONG ANSWERS

- Fracture
- Dislocation
- Suffocation
- Pain

- (ii) State **two** materials that could be used in giving First Aid to the part labelled **I** if injured.

CORRECT ANSWER

- bandage
- cotton wool
- ointment/balm

WRONG ANSWER

- Iodine solution
- splint
- lint
- cotton

- (c) State **two** possible movements in the part labelled **III**.

CORRECT ANSWER

- Flexion/Bending
- Extension/Straightening

WRONG ANSWER

- Upward movement
- Downward movement
- Backward movement

Question 3

The diagram below illustrates injured parts of the human body.
Study the diagrams and answer questions 3(a), (b) and (c)



- (a) (i) Identify the injury in the diagrams:
(ii) Name the types of injuries in diagrams **A** and **B**.

About 60% of the candidates were able to identify the injuries as simple/close fracture in **A** and compound /open fracture in **B**. However, most were writing complicated instead of compound, thus losing marks in question 3 a (ii).

- (iv) State **two** observable features of the injury in diagram **B**.

About 90% of the candidates does not understand the meaning of observable features. Hence, a poor performance in attempting this question.

CORRECT ANSWER

- Bone broken
- Bone tears the flesh/tissue
- Spurt of blood from the injured part/tissue

WRONG ANSWER

- Dislocation
- burn
- Shifting

(b) (i) Name the type of skeleton that the injured bones are associated with.

(ii) Name the injured bone.

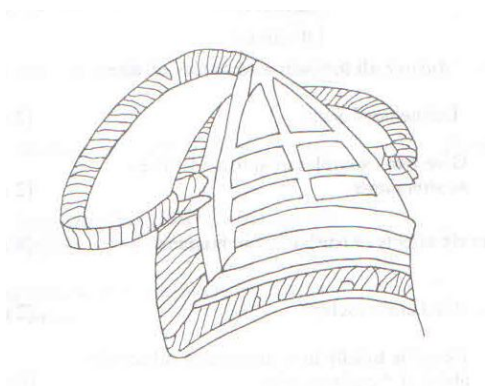
Here, 60% of candidates were able to identify the skeleton as appendicular skeleton in question 3(b) (i) and the injured bone as femur in 3 (b) (ii).

(c) Mention **three** materials that could be used when administering First Aid to the injured parts.

70% of candidates were able to mention materials necessary for administering First Aid to the injured parts eg. splint, triangular bandage, cotton wool etc.

Question 4

The diagram below illustrates a safety device. Study it and answer questions 4(a) (b) and (c).



(a) (i) Name the device in the diagram

(ii) Mention **three** groups of people that make use of the device.

(iii) Name **two** substances that the device prevents.

(b) (i) Mention the system in humans that the device protects.

(ii) List the **two** organs protected by the device illustrated in the diagram.

(c) State the activity to be carried out on the device after use.

90% of the candidates failed to name/identify the device as nose mask, and mention the three groups of people that made use of the device. 40% however, were able to name two substances that the device prevent, namely dust and dangerous chemicals. Also, 30% of the candidates were able to state the activity to be carried out on the device after use, that is;

- Proper care of device;
- Proper disposal of device.

Majority misunderstood the question and hence performed poorly in this question.

Question 5

- (a) (i) Define hard drugs
(ii) Give **two** examples of substances used as stimulants.
- (b) State **six** effects of hard drugs in humans.

Question 5(a) (i) and (ii) were poorly answered by majority of the candidates. They were unable to define hard drugs and give examples of substances used as stimulants. This is due to the fact that they don't know the meaning of the word "stimulants".

However, 70% of the candidates were able to state the effect of hard drugs in humans such as:

- Lead to death
- Wastes money
- Leads to social vices
- Leads to broken homes
- causes mental disorder etc.

Question 6

- (a) (i) What are muscles?
(ii) Describe briefly how movement is brought about at the elbow joint.
- (b) State **two** functions of muscles.

About 80% of the candidates correctly answered questions 6(a) (i) and 6 (b) correctly. 95% of the candidates could not describe the movement brought about at the elbow joint, hence losing the bulk of the mark in this question.

Question 7

- (a) State the causative organism of **each** of the following diseases:
- (i) ringworm;
 - (ii) typhoid fever;
 - (iii) leprosy;
 - (iv) mumps;
 - (v) yaws;
 - (vi) trypanosomiasis (sleeping sickness).

CORRECT ANSWER

7(a) DISEASECORRECT CAUSATIVE ORGANISM

- (i) Ring worm Fungi
- (ii) Typhoid fever Bacteria
- (iii) Leprosy Bacteria
- (iv) Mumps Virus
- (v) Yaws Bacteria
- (vi) Trypanosomiasis Protozoan

WRONG causative organism

- Virus
- Protozoan
- Virus
- Bacteria
- Virus
- Virus

(b) State **four** causes of fire outbreak in the home.

CORRECT ANSWER	WRONG ANSWER
<ul style="list-style-type: none">-Faulty wiring- Over loading of sockets- Power surges- Candle burners/lamps used to produce light- Gas leakage- Faulty electrical appliances	<ul style="list-style-type: none">- Throwing cigarette- Adding water to hot oil

Question 8

(a) (i) Mention the **three** degrees of burns.

CORRECT ANSWER	WRONG ANSWER
<ul style="list-style-type: none">-First degree burn- Second degree burn- Third degree burn	<ul style="list-style-type: none">70 degree80 degree95 degree

(ii) State **two** characteristics **each** of the degrees of burns mentioned in 8(a) (i.)

85% of candidates failed to identify the degree of burns and hence were unable to list out the characteristic of 1st, 2nd, and 3rd degree burn.

(b)
from West Africa.

Name **one** pioneer in mental health

CORRECT ANSWER	WRONG ANSWER
Thomas Adeoye Lambo	<ul style="list-style-type: none">- Thomas- Ronald Ross- Dr. Nickle

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT.
PHYSICAL EDUCATION 2

1. GENERAL COMMENTS

The questions set this year 2017 for Physical Education Paper 2 were straight forward and within the range of an average candidate. Broadly speaking, the majority of candidates from a good number of examination centers did not adequately enhance-in-depth knowledge of the broad range of the topics covered in the examination syllabus.

Generally speaking, there was wide variation in the quality and standard of work of candidates from various examination centers. While some candidates from several examination centers vividly demonstrated clear evidence, that they were fully trained, prepared and qualified for the examination; others from staggered examination centers set out their work in untidy and haphazard manner that deserved no commendation.

2. CANDIDATES' STRENGTHS

A marked improvement has been demonstrated in the following areas.

- Clarity in terms of legibility of work.
- Writing with recommended ball pens.
- Drawing diagrams within the required size on paper.

3. CANDIDATES' WEAKNESSES

- Poor level of preparedness for the examination.
- Inadequate coverage of the syllabus on time.
- Violation of rubrics.

4. SUGGESTED REMEDIES

Candidates will perform better if they:

- are familiar with the basic concepts, principles and operational terms in relation to physical and health education.
- endeavour to cover the examination syllabus on time.
- adhere strictly to examination rubrics.
- Prepare adequately for the examination by given more serious attention to their academic work than other social activities.

5. COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

In athletics, name:

- (a) *the **two** methods of baton take-over in a relay race;*
- (b) ***four** sprint races;*
- (c) ***two** throwing events;*
- (d) ***two** jumping events.*

A very popular question attempted by slightly above 98% of the candidates. Broadly speaking, candidates' answers were highly commendable; hence, their scores were high.

Question 2

- (a) *State **six** offences that can lead to the award of a penalty shot in a hockey game.*
- (b) *State four ways in which striking circle in hockey game is important.*

This was not a popular question. The few that opted for it submitted answers that were irrelevant and consequently their marks ridiculous.

Question 3

- (a) *Draw a badminton court in your answer booklet indicating the following:*
 - (i) *Left service court;*
 - (ii) *Side alley;*
 - (iii) *back boundary line;*
 - (iv) *single's line*
 - (v) *centre line.*
- (b) *List three skills in a badminton game.*

This question was not well attempted by the majority that opted for it. Though their diagrams were of recommended size, good marks were lost due to candidates' inability to label the diagram properly. On the other hand, candidates' responses in relation to Q3. (b) were highly credible.

Question 4

- (a) *Give:*
 - (i) ***three** reasons why the ancient Olympic Games collapsed;*
 - (ii) ***three** reasons for the revival of the modern Olympic Games.*
- (b) *State **four** functions of the Supreme Council for Sports in Africa.*

Not a popular question. Qs 4. (a) (i) and 4 (a) (ii) attracted ambiguous responses from the majority of candidates that opted for them. In the same vein, only about 18% of the candidates that attempted question 4(b) scored good mark.

Question 5

- (a) Mention **four** objectives of the National Council for Sports in Africa.
- (b) State **six** objectives of extramural sports competitions.

This was popular among 90% of the candidates with very good responses. Generally speaking, candidates' submissions in connection with Qs.5 (a) and 5 (b) were highly credited.

Question 6

- (a) List **four** causes of poor posture.
- (b) State **three** causes of **each**.
 - (i) Kyphosis;
 - (ii) Lordosis

Another popular question attempted by the majority of candidates. Q.6 (a) attracted reasonable responses from over 76% of those who attempted it. Qs.6 (b) (i) and (ii) were satisfactorily attempted by those who opted for them.

Question 7

- (a) Name the part of the body where **each** of the following muscles is located.
 - (i) Biceps
 - (ii) Pectoralis
 - (iii) Gastrocnemius
 - (iv) Deltoid
 - (v) Triceps
 - (vi) Quadriceps
- (b) Name the major muscles involved in each of the following movements
 - (i) flexion of the forearm;
 - (ii) flexion of the knee;
 - (iii) extension of the fore arm;
 - (iv) extension of the knee.

This was not a popular question. In fact, candidates' responses expressed grossly their shallow knowledge in relation to human anatomy and exercise physiology. Invariably, their performance was woeful.

Question 8

- (a) Differentiate between intramural and extramural sports competitions.
- (b) State four differences between a minor game and a major game.

Very popular among the majority of candidates. Candidates' submissions were very good as regards Qs.8 (a) and 8 (b). It is in-deed wise and necessary to place on record that very good marks were earned by almost all the candidates that opted for Q.8.

Question 9

- (a) *List four types of tournaments.*
- (b) *State six factors that should be considered in selection a type of tournament.*

Question 9 attracted positive responses from well over 70% of those that attempted it and their scores were good.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
PHYSICAL EDUCATION 3

1. GENERAL COMMENTS

There is a marked increase in the number of entrants in this year's examination for Physical Education paper 3 (performance test). Like that of yester year the paper was tailored to test candidates basic skills, knowledge, principles and concepts of exploratory movements and body mechanics in relation to kinesiological a principles movement engineering.

2. CANDIDATES' STRENGTHS

Some exemplary skills and techniques worth commendable for, would be candidates to emulate were demonstrated by several candidates from numerous centers.

3. CANDIDATES' WEAKNESSES

There was sufficient evidences to proof that several centres lacked indept knowledge of the broad range of topics covered by the syllabus.

4. SUGGESTED REMEDIES

Candidates' performance will improve if Candidates are exposed to intensive practical work early enough to enable them acquire desirable experience designed to enhance critical analysis and independent of thought as apportioned to well planned and frankly designed curriculum essential to understanding effectively the rules and regulations of acceptable practical demonstrations.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

Using appropriate techniques at the run-up, take off, flight and landing phases, executive the long jump such that a good distance is jumped.

There was sufficient evidence to proof that several centres lacked indept knowledge of the broad range of topics covered by the syllabus.

This question was compulsory and therefore popular. Every candidate opted for it. The skills and techniques demonstrated by the majority of candidates from numerous centers in relation to run-up take off flight and landing were highly commendable. On the other himself, ridiculous marks were awarded due to ambiguous techniques exhibited by certain candidates from few centres.

Question 2

Skillfully demonstrate the running of a 60 metres race from start to finish returning a good time.

Physiognomically, a sizeable number of candidates lacked total body flexibility, which led to very poor out-put.

This was another popular number attempted by slightly above 98% of the entire candidates that sat to the examination except for very few candidates, the skills and techniques as apportioned by the candidates excellently addressed the question, hence, reasonable marks were scored.

Question 3

In the 1,500 metres race demonstrate the ‘‘On your marks’’ take-off, running form and finish to return a good time.

Very much unpopular as only about 1.2% of the candidates opted for it. Though unpopular, the few candidates that attempted it demonstrated very good skills and techniques as were demanded by the question thus, their scores were equally good.

Question 4

From a marked line, dribble the hockey ball around placed obstacles in a figure 8 fashion for 30 seconds.

This was highly unpopular, only very few candidates from very few centers opted for it. It is sad to place on record that candidates performance tarayed their shallow knowledge about the activity as the majority grossly deviated from the real skills and techniques required to earn good mark.

Question 5

Take three shots at targets marked around the football goalposts from the penalty spot.

Another popular activity attempted by over 98% of the candidates that sat to the examination. Generally, candidates performance was highly commendable. On the contrary, significant marks were lost based on the out put made by few, candidates in relation to product evaluation

Question 6

Serve five balls in the game of tennis such that each lands in the correct service court.

This was attempted by 46% of the candidates and their scores were on the average. Indeed, about 18% of those who opted for this question did not display good knowledge about the topic. In their techniques in connection with process evaluation were haphazard.

Question 7

From one side of the table tennis table, bounce the ball on the table such that the ball rises high enough for a smash to be executed. Repeat the action five times.

Attempted by slightly above 53% of the candidates with satisfactory performance. Obviously, the level of demonstration purified by the majority of candidates that opted for this activity exhibited their excellent familiarity with the activity hence, their marks were commendable.

Question 8

Skillfully demonstrate body position, hand position, head position, rolling and recovery while performing backward roll.

This was attempted by about 40% of the candidates. Unfortunately, poor body position was common amongst over 50% of those who opted for it; their recovery was clumsy and product porous.

Question 9

Skillfully demonstrate approach, hand placement, take-off, leg position and landing in the performance of through vault.

Attempted by about 60% of the candidates about 50% of those who performed this activity get fair share of the marks allocated as their demonstration was relatively good. On the contrary, certain candidates lost marks based on the fact that their hand placement was poor and their landing-inadequate.

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WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
PHYSICS 3 PRACTICAL
ALTERNATIVE A

1. GENERAL COMMENTS

The standard of the paper was well within the scope of the syllabus. The apparatus involved in all questions were items used in everyday practical exercises. There was no evidence that difficulties were encountered during the practical examinations. If there were any difficulties at all, these difficulties turned out to be more mathematical than physics. The performance of the candidate was better compare to the previous years. Nearly 65% of the candidates who choose alternative a scored 35 marks, about 25% of the candidate fall between the range of 20 to 34 marks and 10% of the candidate scored marks below are average.

2. CANDIDATE'S STRENGTHS

The candidates' strength was notice in both questions but highly perform in question two (2) with accuracy and consistency in their approach to the Graphing, Presentation of data in a tabular form and Evaluation using the graph. Almost 75% of the candidates who attempted the questions scored the full mark.

3. CANDIDATES' WEAKNESSES

Few candidates lack the ability to label axes and choose correct scale. There have been cases where candidates marched point. However, it has been observed in the few centers where candidates express smaller values like 0.254 as 25×10 instead of 25.4×10^{-2} . This shows candidates weakness in expressing small numbers in suitable index form.

Majority of the candidates gave incomplete precautions i.e. not mentioning the actual apparatus that they avoid parallax error when taking readings.

Definition of terms was of a great challenge to nearly 45% of the candidates.

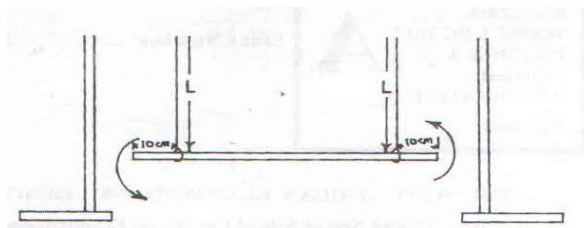
4. SUGGESTED REMEDIES

- For the performance of the candidates to be improved, the physics teachers should endeavor to bring the necessary mathematics skills to mathematics staff for cooperation in their teaching.
- Candidates should be familiar with the definitions and precautions under each practical observed or conducted.
- Teachers should ensure that all sections of the syllabus are well covered both theory and practical.
- Teachers should start practical's with candidates in early stages and include practical's in their various school examinations.
- Teachers should try to familiarize themselves with the chief examiners report as it will help to guide both the teachers and the student of various schools.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

(a)



You are provided with **two** retort stands, **two** metre rules, pieces of thread and other necessary apparatus.

You are provided with **two** retort stands, **two** meter rules, pieces of thread and other necessary apparatus

- (i) Set up the apparatus as illustrated above ensuring that the strings are permanently 10 cm from either end of the rule.
- (ii) Measure and record the length $L = 80$ cm of the two strings.
- (iii) Hold both ends of the rule and displace the rule slightly, then release so that it oscillates about a vertical axis through its center.
 - (iv) Determine and record the time t for 10 complete oscillations.
 - (v) Determine the period T of oscillations.
 - (vi) Evaluate $\log T$ and $\log L$.
- (vii) Repeat the procedure for **four** other values of $L = 70$ cm, 60 cm, 50 cm, and 40 cm.
 - (viii) Tabulate your readings.
 - (ix) Plot a graph with $\log T$ on the vertical axis and $\log L$ on the horizontal axis.
 - (x) Determine the slope, S , and the intercept, C , on the vertical axis, of the graph.
 - (xi) State **two** precautions taken to ensure accurate results.
- (b)
 - (i) Define Simple harmonic motion.
 - (ii) Determine the value of L corresponding to $t = 12$ s from the graph in 1(a).

This was one of the most popular questions answered by the candidates. 50% of the candidates determined the value of T correctly and shows the trend of L and t . Evaluation of $\log L$ and $\log T$ was a challenge in determine the number of decimal places. Candidates round the values obtain to one or two decimal places instead of three decimal places.

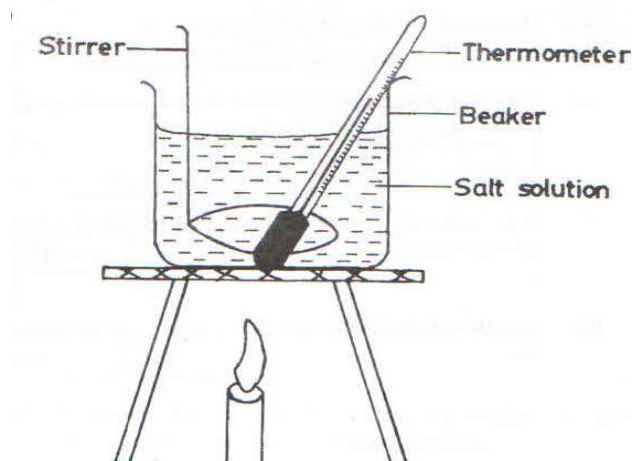
Candidate's inability to choose the right scale disabled on getting the intercept on the vertical axis.

In b(i) the definition of the term simple harmonic has been defined by candidates as to and fro motion of an object.

In b (ii) The value of L at $t = 12$ was left unanswered by majority of the candidates. Few candidates scored marks in this question. They estimated value of $\log L$ which they used to evaluate the value of L

Question 2

(a)



You are provided with a beaker, a thermometer, a stirrer, stop watch/ clock, measuring cylinder, table salt, water and other necessary materials.

- (i) Measure 200 cm^3 of water into the beaker.
- (ii) Heat the water until it boils steadily for about 2 minutes.
- (iii) Read and record the boiling point b_0 .
- (iv) Add table salt of mass $M = 10.0 \text{ g}$ to the boiling water and stir continuously until another boiling point b_i is attained.
- (v) Read and record b_i .
- (vi) Evaluate $\theta = (b_i - b_0)$
- (vii) Using the same mixture, repeat the procedure four more times by adding 10.0 g of salt **each** time to give the cumulative mass M_i of salt as 20 g , 30 g , 40 g , and 50 g .
- (viii) In **each** case allow the mixture to boil steadily for **at least** 2 minute then read and record the boiling point b_i .
- (ix) Tabulate your readings.
- (x) Plot a graph with M_i on the vertical axis and θ_i on the horizontal axis.
- (xi) Determine the slope, S , of the graph.
- (xii) State **two** precautions taken to ensure accurate results.

- (b) (i) Define the boiling point of a liquid.
- (ii) What effect do the impurities have on the boiling point of a liquid?

This was the most popular question it was well answered by candidates and 85% of the candidate who attempted these questions scores the full marks.

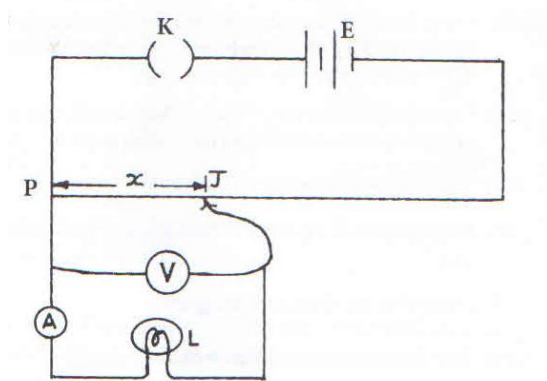
The graph and slope was perfectly drawn. The slope was well determined. However, few candidates scored zero for the precautions. The following were wrong answered giving by candidates.

Increasing the intensity of the fire before getting the readings.
Stirring the water.

The sub question was not well answered by the candidates; they defined boiling as the temperature at which water change from liquid to vapor.

Question 3

(a)



You are provided with cells, a potentiometer, an ammeter, a voltmeter, a bulb, a key, a jockey and other necessary materials.

- (i) Measure and record the e.m.f E of the battery.
- (ii) Set up a circuit as shown in the diagram above.
- (iii) Close the key K and use the jockey to make a firm contact at J on the potentiometer wire such that $PJ = x = 10\text{cm}$.
- (iv) Take and record the voltmeter reading V and the corresponding ammeter reading I .
- (v) Evaluate $\log V$ and $\log I$
- (vi) Repeat the procedures for **five** other values of $x=20\text{ cm}$, 30 cm , 40 cm , 50 cm , and 60 cm .
- (vii) Tabulate your readings.
- (viii) Plot a graph with $\log I$ on the vertical axis and $\log V$ on the horizontal axis.
- (ix) Determine the slope' S , of the graph.
- (x) Determine the intercept, C , on the vertical axis.
- (xi) State **two** precautions taken to ensure accurate results.

- (b) (i) How is the brightness of the bulb affect as X increases? Give a reason for your answer.
- (ii) List **two** electrical devices whose actions do **not** obey ohm's law.

It still believe that schools do not have enough electrical apparatus in their possession and so year after year they end up forfeiting the easiest question (the electrical once) in the examination. It is admitted that this electrical equipment are expensive but genuine effort must be made to store Ammeters, Voltmeters, Jockeys and Switches. In fact candidates must also be taught how to connect them in simple circuits. This year the attempts were too little and so we could not have much to comment about.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
PHYSICS PRACTICAL ALTERNATIVE B

1. GENERAL COMMENTS

The standard of the paper was quite appropriate for the candidates. The questions selected covered a very wide range of topics across the syllabus. All the three questions were straight ward testing candidate's knowledge of the syllabus.

The marking scheme was detailed and flexible in its interpretation to accommodate the various answer provided by the candidates. The performance of candidates generally was impressive compared to the previous examination. However, 5% candidates scored zero mark, 40% of the candidates score marks within the range of 10 – 29 and 55% of the candidates score marks within the range of 30 -50.

2. CANDIDATES' STRENGTHS

Candidates exhibited some understanding in:

- Drawing of graphs
- Tabulating reading
- Precautions
- Evaluation

A greater percentage of the candidates performed above the average score. They performed the experiment showing the trends of the values and were able to present the result in a tabular form showing the information.

3. CANDIDATES' WEAKNESSES

Candidates showed some weakness in:

- Accuracy
- Deduction
- Problems involving calculations
- Definition of terms
- Omission of units in the table
- Evaluation of reciprocal of log to one(1) and two(2) decimal points instead of three(3) decimal places .

4. SUGGESTED REMEDIES

Candidates need to:

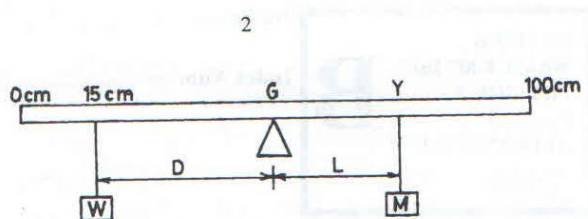
- Prepared very well for the examination
- Possess their personal Electronics calculators and learn to them properly.
- Access the past questions paper to be familiar with the format of questions.
- Take their time to read the questions and understand them before answering the questions.

- Candidates should be familiar with the definitions and precautions under each practical observed or conducted.
- Teachers should ensure that all sections of the syllabus are well covered for both the theory and practicals.
- Teachers should start practical's with their candidates in the early stages and include practical's in their school exams.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

(a)



You are provided with a uniform meter rule, a knife edge, masses and other necessary apparatus.

- Suspend the meter rule horizontally on the knife edge. Read and record the point of balance G of the meter rule. Keep the knife edge at this point throughout the experiment.
- Using the thread provided, suspend the object labeled W at the 15 cm mark of the meter rule.
- Suspend a mass M = 20 g on the other side G. Adjust the position of the mass until the meter rule balances horizontally again.
- Read and record the position Y of the mass M on the meter rule.
- Determine and record the distance L between the mass and G. Also determine and record the distance D between W and G.
- Repeat the procedure for four other values of M = 30 g, 40 g, 50 g, and 60 g. In each case, ensure that W is kept constant at 15 cm mark and the knife edge at G.
- Evaluate \underline{L}^{-1} in each case. Tabulate your readings.
- Plot a graph of M on the vertical axis against \underline{L}^{-1} on the horizontal axis.
- Determine the slope, s, of the graph.
- Evaluate $\frac{s}{D}$.
- State two precautions taken to ensure accurate results.

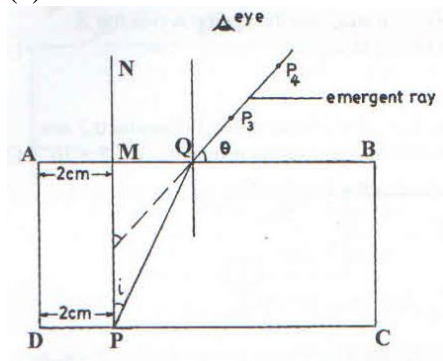
- (i) State the principle of moments
- (ii) Define center of gravity.

The value of D was not correctly determined by 25% of the candidates, half of the candidate record the reciprocal of L to one decimal place instead of three 3 decimal places.

The graph and slope were correctly drawn and determined by more than 60% of the candidates. However, 10% of the candidates who merged the point score a zero marked for the slope and intercept. Few candidates use incomplete phrase for the definition.

Question 1

(a)



You are provided with a rectangular glass prism, cellotex board, **four** optical pins, **four** thumb pins and other necessary apparatus.

Using the diagram above as a guide, carry out the following instructions.

- (i) Fix a plane sheet of paper on the drawing board.
- (ii) Place the rectangular glass prism on the paper and trace its outline, ABCD. Remove the prism.
- (iii) Draw a normal NMP to meet AB and DC at M and P respectively such that $\frac{AM}{DP} = 2.0$ cm
- (iv) Trace the ray PQ with two pins, P₁ and P₂ at P and Q respectively such that angle MPO = i = 5°
- (v) Replace the prism on its outline. Trace the emergent ray with two other pins P₃ and P₄ such that they lie in a straight line with P₂ and the image of P₁ viewed through the glass prism.
- (vi) Measure and record theta, the angle between the emergent ray and face AB of the glass prism.
- (vii) Evaluate $\cos \theta$ and $\sin i$
- (viii) Repeat the procedure for **four** other values of $i = 10^\circ, 15^\circ, 20^\circ, \text{ and } 25^\circ$. Tabulate your readings.
- (ix) Plot a graph of $\cos \theta$ on the vertical axis against $\sin i$ on the horizontal axis.
- (x) Determine the slope of the graph.
- (xi) State **two** precautions taken to ensure accurate results
[Attach your traces to your answer booklet]

- (b)
 - (i) State the law of refraction of light.
 - (ii) Explain what is meant by the statement the refractive index of a material is 1.65.

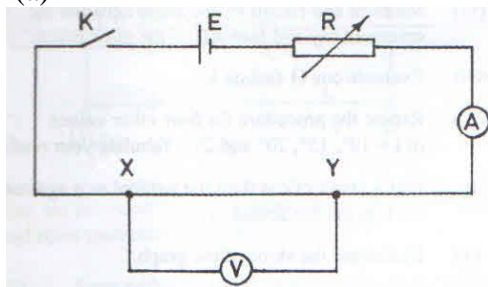
This was one the most popular question answered by the candidates in this paper. Candidates fully demonstrated their understanding in by completely drawing and outlining the five complete traces of i incident and refraction. Less than 10% of the candidate drew the traces without any traces of pin marks.

The graph and slope were well attempted and fully answered; only 30% of the candidate obtained a mark for accuracy of the slope value.

Precautions were well answered in acceptable language. 35% of the candidates couldn't explain the meaning of refractive index as 1.65.

Question 2

(a)



You are provided with an ammeter, a voltmeter, a key, resistance box, connecting wires, dry cell and other necessary apparatus.

- (i) *Measure and record the length XY of the resistance wire provided.*
- (ii) *Connect the circuit as shown in the diagram above.*
- (iii) *With $R = 0\Omega$, close the key, Read and record the current I_0 and the voltage drop V_0 across the resistance wire.*
- (iv) *Setting $R = 1\Omega$, close the key. Read and record the current, I and the corresponding voltage drop, v across the wire.*
- (v) *Repeat the procedure for five other values of $R = 5\Omega, 10\Omega, 20\Omega, 40\Omega$, and 60Ω . Tabulate your readings.*
- (vi) *Plot a graph of V on the vertical axis against I on the horizontal axis.*
- (vii) *Determine the slope of the graph*
- (viii) *State two precautions taken to ensure accurate results.*

(b) (i) *Mention and state the on which the experiment in 3(a) is based.*

(ii) *A piece of resistance wire of diameter 0.2mm and resistance 7Ω has resistivity of $8.8 \times 10^{-7}\Omega m$, calculate the length of the wire. $[\pi = \frac{22}{7}]$*

This was the second most popular question in alternative B. most candidates correctly obtained the values in their trends. However, a good number of them omitted the units. Candidates were weak in determine the slope in their graphs. Few candidates directly select values from their table to determine the slope.

Precautions were well written, less than 15% of the candidates couldn't express themselves in an acceptable language like

Putting on the key before taking reading

Tightening the wires

(b) (i) most candidates didn't mention "provide the temperature is constant" in the definition of ohms law

(ii) 75% of the candidates couldn't evaluate the value of L by using the formula $l = \frac{AR}{P}$

**WASSCEFOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
PHYSICS 2**

1. GENERAL COMMENTS

The paper was of the same standard as that of last year. Any well prepared candidate should be able to score at least 30 marks (ie 50%) on this paper. The questions selected covered a wide range of topics across the syllabus.

The performance of the candidates generally was not impressive. It seems that majority of the candidates did not prepared well for the exams and as a result, the scores were fairly poor.

2. CANDIDATES' STRENGTHS

The scripts of the candidates did not show any notable strength. However, the few well prepared candidates were able to earn average marks in most of the questions in part one (1).

3. CANDIDATES' WEAKNESSES

About 70% of the candidates scored below 15 marks out of a total of 60 marks. It was discovered that most of the candidates were unable to explain, List and Define or State common physical principles the exams was asking for. Most of the candidates could not have any of the calculations right.

4. SUGGESTED REMEDIES

Improvement in candidates' performance in subsequent examination can be enhancing by considering the following:

- Familiarizing with the syllabus and its contents
- Attention should be given to practical applications of basic physics concepts.
- Adequately revising all the topics in the different sections of the syllabus, rather than few selected topics.
- Interpreting the questions correctly prior to answering.
- If questions require candidates to explain a concept, it is not just enough to write sentence definition. Additional fact should be mention were necessary well labeled diagrams should be drawn.
- Understanding the principles related to mathematical concepts and how each is applied in ordinary calculations.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

A particle is dropped from a vertical height h and falls freely for a time t . with the aid of a sketch, explain how h varies with t^2 .

It was attempted by 70% of the candidates. It was also a popular question and about 1% of those who attempted it scored full marks (total of 3)

There were many zeros. Many candidates drew wrong diagrams, and so lost one (1) out of three (3) marks. Wrong diagrams made them not to explain how h varies with t^2 . The expected answer was h decrease linearly with t^2 .

Question 2

*A particle is projected horizontally 15ms^{-1} from a height of 20 m. calculate the horizontal distance covered by the particle just before hitting the ground.
[$g = 10\text{ms}^{-2}$]*

This was a very popular question attempted by 85% of the candidates. About 10% of those who attempted it scored full marks (total of three 3). Many candidates could not find the time taken by the particle to hit the ground and as a result of this, had the horizontal distance wrong.

From $h = gt^2/2$, $t = \sqrt{2h/g}$

From $R = u\sqrt{2h/g}$, where R is the horizontal distance.

Question 3

*List **three** phenomena which can be explained by the molecular theory of matter.*

This question was done by about 90% of all the candidates. About 40% of these scored 1, 2 or 3 marks out of a maximum of three.

There were many zeros proving that many candidates did not understand the concepts properly. Most candidates were explaining the nature of molecules in the three states (i.e. solid, liquid and gas).

Question 4

A spiral spring has a length of 14 cm when a force of 4N is hung on it. A force of 6N extends the spring by 4 cm. calculate the unstretched length of the spring.

About 60% of the candidates attempted this question. Most of these candidates scored zero.

About 0.8% scored the full three marks. In many centers, all the candidates scored zero.

Many candidates used the idea of young's modulus to solve instead of the ordinary relationship from Hooke's law

$$\text{i.e. } \frac{f_1}{e_1} = \frac{f_2}{e_2}$$

Question 5

- (a) State **two** factors on which surface tension depends
(b) How can mosquito larvae be made to sink in stagnant water?

This was a very popular question. About 92% of the candidates attempted this question. About 30% of those candidates scored at least one mark. An answer like the nature of the liquid earned them a mark.

Surface tension depends on;

- Purity of liquid;
- Temperature of the liquid;
- Nature/ type of liquid;
- Mosquito larvae can be made to sink by the addition of;
- Detergent;
- Alcohol;
- Heat;
- Camphor.

The above named points were the expected answers.

Question 6

List **three** advantages of fluorescent tube over filament bulbs

This was quite an easy question for any well prepared candidate. The three marks could be earned in just three daily observations like, the fluorescent tubes;

Brighter,
Produce less heat,
Last longer,
Consume less electrical energy

This question was attempted by about 60% of the candidates. About 0.2% of these scored 2 or 3 marks out of a maximum of three. There were many zeros.

Question 7

List **three** advantage of $p - n$ junction diode over diode valve

This question was not popular. About 10% of the candidates attempted it. Amongst those who attempted it there is no candidates who scored the fully three marks.

Majority of the candidates were not giving the advantages of $p - n$ junction diode over the diode valve instead stating characteristic of $p - n$ junction diode.

Question 8

- (a) State **two** deduction that can be made from a displacement – time graph.
- (b) If the distance between **two** equal masses is doubled and their individual masses are doubled, what would happen to the force between them? Support your answer quantitatively.
- (c) State **two** factors that affect the maximum height attained by a bullet fired from a gun.
- (d) State **two** practical examples of mechanical resonance.
- (e) A body is released from rest at the top of a plane inclined at 30° to the horizontal and 4.0 m high. If the coefficient of friction between the body and the plane is 0.3, calculate the time the body takes to reach the bottom of the plane.

This question was a popular question. About 70% of the candidates attempted it. However about 90% of the candidates who attempted it misinterpreted the the displacement – time graph as a velocity – time graph and as a result, wrong deductions were made.

About 2% of the candidates state Newton's law of gravitation correctly

i.e. $F = \frac{GMm}{r^2}$

More than half of this group could not justify quantitatively what would happen to the force between the two equal masses if their distance is doubled.

The expected answer is 'the force would remain the same.

For (c) part of the question, most of the candidates could state acceleration due to gravity and resistance as factors that could affect the maximum height attained by a bullet fired from a gun. About 0.8% of the candidates earned 1 or 2 marks for stating practical examples of the mechanical resonance.

Almost all the candidates were unable to solve the last part of the question. The candidates could not find the net force when a body moves down the inclined plane.

i.e. $Ma = mg\sin\theta - F\mu$

Resolving the body into components is also a problem. As a result of all these difficulties, the time taken for the body to reach the bottom of the plane was not achieved.

Question 9

- (a) Define stable equilibrium as applied to a rigid body.
- (b) Sketch a block and tackle system of pulleys with a velocity ratio of 3.
- (c) At the beginning of a race, a tyre of volume $8.0 \times 10^{-4} \text{ m}^3$ at 20°C has a gas pressure of $4.5 \times 10^5 \text{ Pa}$. Calculate the temperature of the gas in the tyre at the end of the race if the has risen to $4.6 \times 10^5 \text{ Pa}$.
- (d) (i)

	Ice point 273K	Steam point 373K
Resistance/ Ω	5.67	7.75
Pressure/Pa	7.13×10^4	9.74×10^4

The table above shows readings of the resistance and pressure of a platinum resistance thermometer and a constant – volume gas thermometer respectively, when immersed in the same liquid bath. Use this data to determine the temperature of the bath on the:

- (α) resistance thermometer;
- (β) gas thermometer

(ii) *By what percentage is the temperature measured on the platinum resistance thermometer error?*

This was a popular question. About 75% of the candidates attempted this question. Candidates who scored marks from this question were obtained from the (a), (b) and (c) part of the question. Almost all the candidates could not answer the (d) part of the question.

Few of them define stable equilibrium, could sketch a block and tackle system of pulleys with velocity ratio of 3 and this percentage of candidates is insignificant.

Question 10

- (a) *what is a wavefront?*
- (b) (i) *State two practical uses of glass prisms.*
- (ii) *List two factors that determine the deviation of a ray of light travelling from air into triangular glass prisms*
- (iii) *Sketch a graph to illustrate the variation of the angle of deviation, d, with that of incidence i, for a ray of light travelling from air into a triangular glass prism. Indicate on the graph the point at which the angle of incidence i is equal to the angle of emergence e.*
- (c) (i) *Draw and label a diagram of an astronomical telescope in normal adjustment.*
- (ii) *The angular magnification of an astronomical telescope in normal adjustment is 5. If the focal length of the objective is 100 cm, calculate the:*
 - (α) *focal length of the eyepiece,*
 - (β) *length of the telescope.*

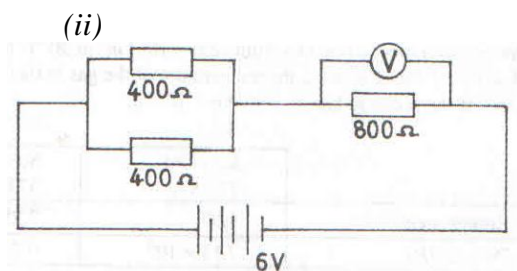
This was a fairly popular question done by 55% of the candidates most of them could not describe a wavefront, state practical uses of glass prisms, list factors that determine the deviation of a ray of light travelling from air into a triangular glass prism, sketch a graph to illustrate the variation of the angle of deviation, with that of incidence, i, for a triangular glass prism. Lack of proper coverage of the syllabus and poor preparation for the exams robbed candidates from fairly easy works. Five candidates drew the astronomical telescope in normal adjustment correctly.

Few candidates state the magnification formula well.

i.e $M = \frac{f_o}{f_e}$.

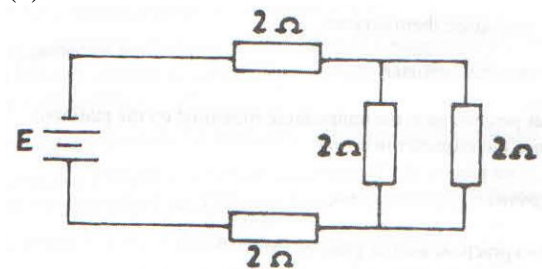
Question 11

- (a) (i) *What is dielectric ?*
- (ii) *A parallel plate capacitor consists of two plates each of area $9.6 \times 10^{-3} \text{ m}^2$, separated by a dielectric of thickness $2.25 \times 10^{-4} \text{ m}$ and dielectric constant 900. Calculate the apacitance of the capacitor. [ϵ_0 = permittivity of free space = $8.85 \times 10^{-12} \text{ Fm}^{-1}$]*
- (b) (i) *Which of the following devices has a higher resistance: an ammeter or a voltmeter? Give a reason for your answer.*



The resistance of the voltmeter in the circuit diagram illustrated above is 800Ω . Calculate the voltmeter reading.

(c)



A battery of negligible internal resistance is connected to a set of resistors as illustrated in the circuit diagram above. Determine the equivalent resistance of the circuit.

This question was popular. About 78% of the candidates attempted this question. About 0.5% of these candidates could explain what dielectric is. Majority were describing it as a conductor rather an insulating material separating the plate of a capacitor. Also, less than 1% could state the formula

$$C = \frac{\epsilon r \epsilon_0 A}{d} \text{ and substitution was also a problem. There were many zeros in this question.}$$

The (bi) part of the question gave a 50 /50 chance of answering the question but, however, those candidates who gave the voltmeter as answer could not justify the reason.

In (bii) , all the candidates had this question wrong. About 20% of these candidates got the resistance of the parallel combination of the two 400Ω resistor identified the other parallel combination of the resistance of the voltmeter and the 800Ω resistor. However, some candidates from this group preceded using ohm's law to find the current which they eventually used to find the voltmeter reading.

About 0.3% the candidates who attempted this question scored all the three marks of the (c) part.

Question 12

(a) (i) what is nuclear fission?

(ii) State the function of **each** of the following materials in a nuclear fission reactor:

(α) graphite;

(β) boron rods;

(γ) liquid sodium

(b) The table below gives some of the energy level of a hydrogen atom.

n	1	2	3	4	5	∞
E_n/eV	-13.60	-3.39	-1.51	-0.85	-0.540	0.00

- (i) Draw the energy level diagram for the atom.
- (ii) Determine the wavelength of the photon emitted when the atom goes from the energy state $n = 3$ to the ground state.
 $[h = 6.6 \times 10^{-34} \text{ Js}, c = 3.0 \times 10^8 \text{ ms}^{-1}, e = 1.6 \times 10^{-19} \text{ C}]$
- (c) A piece of ancient bone from an excavation site showed ^{614}C activity of 9.5 disintegration per minute per $0.1 \times 10^{-3} \text{ kg}$. if a bone specimen from a living creature shows ^{614}C activity of 12.0 disintegrations per minute per $1.0 \times 10^{-3} \text{ kg}$, determine the age of the ancient bone.
 $[\text{Half-life of } ^{614}\text{C} = 5572 \text{ years}]$

This was a fairly popular question. About 65% of the candidates attempted this question, but About 20% of these candidates could explain what nuclear fission is well. Some of them omit the release of huge amount of energy.

About 0.6% of the candidates could state the function of graphite, boron rods and liquid sodium as materials used in a nuclear fission reactor. Candidates from most centers could not score a mark from this question.

In the (bi) part of the question, less than 1% could draw the spaced lines with labels correctly. For (bii), about 60% of these candidates could state the formula

$$\lambda = \frac{hc}{\Delta E}$$

Few substituted correctly into the formula and had the answer right. About 30% of the candidates quoted the relevant formula for half-life correctly

i.e. $T_{1/2} = \frac{0.693}{\lambda}$ but some of them could not use natural logs when they stated the formula $N = N_0 e^{-\lambda t}$ there were many zeros in this question.

WASSCEFOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
SCIENCE 2

1. GENERAL COMMENTS

The marking process went on smoothly the process was very slow this year due to the 100% vetting that was introduced. The questions were drawn from the scope of the syllabus and they were at candidates' level. The paper contains good blend of application type questions and easy-to-recall types. Nevertheless, the performance of candidates from some centers was very poor, about 15% of candidates scored zero. About 14% of all candidates scored 20 and above marks; about 13% others scored between 19-15 marks. The candidates' abilities were far below standard in the physics and chemistry aspects this year. The questions were drawn from the 3 aspects of the syllabus. Candidates lost many marks as a result of wrong spelling of scientific terms and wrong units. In general the performance of the candidates has revealed that most of the candidates were not well prepared for the examination.

2. CANDIDATES' STRENGTHS

- Candidates understood the concept of *ventilation* and the ways of ensuring proper ventilation in a room.
- Like the previous years, candidates' performance was commendable in *cell theory* and *movement of substances across the cell*. This was evident in the answers given in question 7 (a).
- Candidates also performed very well in other biological questions like *digestion* and *Family Planning*.
- The rubrics of the paper was followed by the candidates; i.e. answering all the questions in section I and two other questions from section II

3. CANDIDATES' WEAKNESSES

- Difficulty in answering questions that require calculations like *mole concept* and *Archimedes' Principle*.
- Giving wrong SI unit for *density*.
- Incomplete coverage of the syllabus. This was evident in the poor performance of candidates in *genetics* and *variation*.
- Stating the functions of the parts of a joint.
- Candidates generally performed poorly in Chemistry and Physics questions.

4. SUGGESTED REMEDIES

- Science teachers should constantly give calculation problems to students especially in Physics and Chemistry that requires calculation so as to enhance students' skills in calculation.

- As stated in the general report above, the performance is generally poor, to overcome this, it is pertinent to engage students also in psychomotor domain which involve more of practical work as this makes learning more permanent thereby making recall easy during examination.
- Candidates should try to cover all aspects of the syllabus well before the examination for better performance.
- Teachers and candidates are encouraged to revise past examination questions together to build their confidence.
- Both students and teachers should visit relevant websites to update themselves with scientific discoveries and their applications.
- In answering questions, candidates should use legible handwriting and correct spelling for scientific terms.
- Candidates should try to use recommended text books to be on course.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

- (a) *Distinguish between density and relative density.*
 (b) (i) *State the SI unit of Density.*
 (ii) *Explain why relative density has no unit.*

About 30% of the candidates were able to correctly stated the difference between density and relative density, while about 40% wrongly stated that density is ratio of volume to mass and relative density is the relative of mass to water. Few candidates also stated that density is the ratio of weight to volume.

About 50% of the candidates could not correctly state the SI unit of density as they stated the following: g/cm^3 , Kg/m^{-3} , kgcm^{-3} , Nm^3 , g/m^{-3} .

About 65% of the candidates could not correctly state why relative density has no unit; some stated that it is the density of water; it is mass of substance etc.

Question2

- (a) *Name the **main** ore from which aluminium is extracted.*
 (b) *Name **two** properties of aluminium which make it suitable for use as cooking utensils.*

Only about 20% of the candidates could correctly state the ore of aluminium. Many candidates stated that it is extracted from silver, iron ore, Alum ore and soil. Also about 25% of the candidates could not correctly spell a “bauxite”;. Some wrong spellings were Bauxide, Bexite, Baxite etc.

About 20% of the candidates stated the general properties of metals such as ductility, malleability, conductivity of electricity, shiny etc. Few candidates scored great marks though.

Question 3

- (a) *Distinguish between continuous variation and discontinuous variation.*
- (b) *Give **two** examples **each** of:*
 - (i) *continuous variation;*
 - (ii) *discontinuous variation.*

Less than 10% of the candidates could correctly differentiate between continuous and discontinuous variation, Some stated that it is inherited from both parents and some stated that it's inherited from one of the parents. Some also stated it is transferred from generation to another.

About 20% of the candidates misplaced those traits for the items i.e. note the traits for continuous variation and discontinuous variation and vice versa.

Question 4

- (a) *Name **two** gases which are related to green-house effect.*
- (b) *Mention **two** consequences of global warming.*

Only about 15% of the candidates were able to state that carbon dioxide, methane and fluorochlorocarbon were some of the gases that causes green-house effect. Majority stated nitrogen, carbon monoxide and oxygen.

Only 20% were able to state the correct effects of these global warming on the environment. Some of them stated the following: it causes pollution, it causes cancer and it leads to depletion of the ozone layer.

Question 5

*State **one** function **each** of the following structures found in moveable joints.*

- (a) *Synovial Fluid*
- (b) *Synovial membrane*
- (c) *Ligament*
- (d) *Cartilage*

About 16% of the candidates were able to state the function of the structures. Question 5 (d) was the most attempted; 5(a) was the most correctly attempted; 5(b) was wrongly said to be covering the synovial fluid instead of producing it. Most of the candidates described the structures instead of stating their functions.

Question 6

- (a)
 - (i) *What is meant by the term ventilation?*
 - (ii) *State **three** ways of ensuring proper ventilation in a room.*
- (b)
 - (i) *Explain the following terms:*
 - I. *phenotype*
 - II. *genotype*
 - (ii) *The offspring of a tall man and a short woman were all found to be tall. With the aid of appropriate crosses, illustrate the above information.*

- (c) (i) *State Archimedes' principles*
 (ii) *An object weighs 250 N in air and 130 N when completely immersed in water.*
Determine each of the following:
I. Apparent loss in weight of the object;
II. Up thrust on the object;
III. Volume of the object.
- (d) (i) *What is a neutralization reaction?*
 (ii) *Distinguish between neutralization and esterification reactions.*
- (a) (i) *What is meant by the term ventilation?*
 (ii) *State **three** ways of ensuring proper ventilation in a room.*

About 60% of all the candidates attempted this question. About 65 of the candidates that attempted this question were able to define the term ventilation and were also able to state the ways of ensuring ventilation of a room, but about 20% of this candidates wrongly describe as a process of treating sick animals. Some stated that it is ensuring that rooms and environment are kept clean to avoid sickness causing organisms. Fewer candidates were able to attempt the test crossing.

- (b) (i) *Explain the following terms:*
I. phenotype
II. genotype
 (ii) *The off springs of a tall man and a short woman were all found to be tall.*

With the aid of appropriate crosses, illustrate the above information.

On the difference between phenotype and genotype, about 70% of the candidates wrongly stated the difference between the two terms.

- (c) (i) *State Archimedes' principles*
 (ii) *An object weighs 250 N in air and 130 N when completely immersed in water.*

Determine each of the following:
I. Apparent loss in weight of the object;
II. Up thrust on the object;
III. Volume of the object.

Only about 10% of the candidates that attempted this question were and to state the Archimede principle correctly, majority stated law of floatation instead, some stated and that when a body is immersed in a fluid it expresses an up thrust which is equal to the weight of the body.

ii. The calculation of the up thrust was got correct by about 40% of those that attempted the question, though some of them lost the mark for units (-1/2) of the full work.

- (d) (i) *What is a neutralization reaction?*
 (ii) *Distinguish between neutralization and esterification reactions.*

- (a) (i) *What is meant by the term ventilation?*
 (ii) *State **three** ways of ensuring proper ventilation in a room.*

About 70% of the candidates that attempted this question were able to define neutralization reaction, but majority of them could not correctly differentiate between neutralization reaction and esterification as majority found it difficult to describe esterification reaction. This indicates that many schools fail to expose/treat the organic chemistry aspect of the syllabus.

Question 7

- (a) (i) State **two** substances which are exchanged between a cell and its environment.
(ii) Name **two** processes by which materials pass through a selective permeable membrane.
- (b) (i) What is an alloy?
(ii) State **two** advantages of alloys over their constituent elements.
(iii) Name the alloy which has the following constituent elements:
I. aluminium, copper, magnesium and manganese;
II. copper and zinc;
III. iron, carbon and chromium.
- (c) (i) Name the process by which food passes through the alimentary canal in humans.
(ii) Briefly describe how absorption of digested food occurs in humans.
(iii) Mention two practices which cause indigestion in humans.
- (d) (i) Define electric power.
(ii) An electric stove is rated 1, 200 W, 240 V. Determine the maximum rating of the fuse required for the safe operation of the stove.
- (a) (i) State **two** substances which are exchanged between a cell and its environment.
(ii) Name **two** processes by which materials pass through a selective permeable membrane.

It is the second attempted question after Q.6.

About 75% of the candidates that attempted this question were able to state correctly the two substances that are exchanged between a cell and its environment.

About 60% of candidates that attempted this question were able to correctly state the process by which materials pass through a selective permeable membrane, only very few of the candidates got this wrong by stating absorption as one of the process.

- 7.(b) (i) What is an alloy?
(ii) State **two** advantages of alloys over their constituent elements.
(iii) Name the alloy which has the following constituent elements:
I. aluminium, copper, magnesium and manganese;
II. copper and zinc;
III. iron, carbon and chromium.

About 70% of the candidates that attempted this question lost 1 mark by stating that an alloy comprises of metals or non- metals, they omitted term uniform mixture from the definition.

Only about 10% of the candidates got 1 or 2 of the 3 marks allocated to question 7 b(ii) by stating correctly duralumin and brass. Instead of stainless steel in b(i) iii, about 80% of the candidates Stated steal.

- (c) (i) Name the process by which food passes through the alimentary canal in humans.
(ii) Briefly describe how absorption of digested food occurs in humans.
(iii) Mention two practices which cause indigestion in humans.

Question 7 (c) was poorly attempted by the candidates. About 60% of them could not state the process but instead stated 'digestion'. About 50% of those that had the idea also wrongly spelt 'peristalsis'.

About 75% of the candidates that attempted 7(c)(iii) question 7(c)(ii) described digestion instead of absorption in human.

About 70% of those that attempted question were able to answer it correctly.

(d) (i) *Define electric power.*

(ii) *An electric stove is rated 1, 200 W, 240 V. Determine the maximum rating of the fuse required for the safe operation of the stove.*

About 65% of the candidates that attempted question could not define correctly electric power, some defined it as power of electricity, some stated that it produce light, electricity and make fan.

7d.ii. About 65% of the candidates that attempted this question got two marks out of the three allocated in that the formula was omitted by some of them and also the unit was wrongly stated.

Question 8

(a) (i) *Distinguish between a conductor and an insulator.*

(ii) *State **two** process by which heat energy travels through liquids which are heated in an aluminium pot.*

About 70% of those that attempted question 8 a(i) were not able to distinguish between conductors and insulators; some of them described conductors are solids and insulators are liquids.

About 60% of candidates that attempted question 8 a(ii) got it correct. Those that got it wrong stated 'radiation' a process through which heat entry travels in liquid heated in aluminium pot.

(b) (i) *What is family planning?*

(ii) *State **three** advantages of practicing family planning.*

About 40% of candidates that attempted question 8(b)(i) got it correctly by defining family planning. However few explained it as a way of reducing the number of children in a family or country. Others also defined Family Planning as a way of not having children in a family. About 10% of them stated that it is a way a woman will not have children after having sex with another man apart from the husband.

About 70% of the candidates that attempted question 8(b)(ii) got it correctly by stating the advantages of family planning.

(c) (i) *What is a simple machine?*

(ii) *Define the following:*

I. *mechanical advantage;*

II. *efficiency of a machine.*

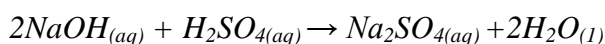
III. *describe the process involved in raising the human arm.*

Only few, about 38% of the candidates were able to correctly define simple machines in question 8(c). Majority wrongly define it as 'a tool used in farm, a tool use to do small work in the farm etc.

Only about 50% of the candidates were able to correctly define mechanical advantage. Some wrong define it as the ability of machine to do work. Defining efficiency was more poorly answered than mechanical advantage. Efficiency was defined by candidates as the simplicity of a machine, the amount of work done by the machine etc. Also many did not include the expression "in percentage" in the definition.

About 85% of those that attempted this question could not describe the process involved in raising the human arm.

- (d) *An aqueous sodium hydroxide solution was prepared by dissolving 3.0g of its pellets in 250 cm³ of distilled water. The resulting solution was reacted with excess dilute tetraoxosulphate (VI) acid according to the equation below.*



- (i) *Calculate the concentration of the sodium hydroxide in mol dm⁻³*
(ii) *Determine the mass of Na₂SO₄ formed during the reaction.*
[H = 1.0; O = 16.0; Na = 23.0; S = 32.0]

This was the most poorly answered question and the question that was avoided by most candidates. Few candidates that scored marks here only scored one mark the calculation of moles for the correctly stating of the formula.

Question 9

- (a) (i) *What is meant by the term tissue respiration?*
(ii) *Describe the mechanism of exhalation in humans.*
(iii) *State **one** component of exhaled air.*

Only about 20% of the candidates that attempted question 9(a)(i) got it correct. About 80% of them defined tissue respiration as gaseous exchange.

Less than 3% of the candidates that attempted question 9 (a)(ii) got the full marks allocated. Many others describe it as gaseous exchange.

- (b) (i) *Name **three** sources of natural water.*
(ii) *State **three** advantages of hard water.*

About 95% of those that attempted question 9(b)(i) scored 2 out of 3 marks allocated. Few candidates mention "tap water" as a natural source of water which is wrong.

About 70% of those that attempted this question performed badly because they stated the disadvantages of hard water such as "it wastes soap", instead of the advantages.

- (c) *Explain the following observations:*
(i) *lightning is seen before the thunder is heard;*
(ii) *a child holding a long metal rod with one end in fire feels the burning sensation in his palm;*

(iii) *a clinical thermometer breaks when used to measure the temperature of boiling water.*

Only about 40% were able to answer correctly this question. Majority of the candidates just rewrite the question.

(d) *an object is placed 20 cm from the centre of a converging lens of focal length 15 cm. calculate the distance of the image from the mirror.*

Only about 40% of those that attempted this question were able to answer it correctly, others merely multiplied the object length and the focal length.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
SCIENCE 3

1. GENERAL COMMENTS

The standard of this year's paper is as good as those of the previous years. The questions are within the scope of the syllabus and touched on all the three main areas of science (. The language and structure of the questions were straightforward and easy to discern. Despite these chemistry, physics and biology) favourable features, candidates' performance was below the standard of the paper.

2. CANDIDATES' STRENGTHS

Despite the observations made above, candidates demonstrated some strength in the following areas:

- Reading and tabulation of data.
- Plotting of the graph in question 2.
- Measurement of distances as in question 2.
- Identification of parts of illustrates structures and set – ups.

3. CANDIDATES' WEAKNESSES

- Spelling errors: This was evident in labeling the parts of the human arm, the diagram for distillation and the parts of the vertebrae.
- Weak practical knowledge.
- Inability to interpret questions well.
- Inadequate preparation.
- Failure to adhere to rubrics.
- Poor arrangement of answers to questions.
- Poor numbering of answers.

4. SUGGESTED REMEDIES

- Adequate preparation is crucial for any examination. Candidates intending to take the examination must ensure that they areadequately preparedbefore attempting this examination.
- More practical lessons should be incorporated in the teaching and learning of science. The lack of practical lesson was evident in question one. About 80% of the candidates either scored zero or did not attempt the question.
- Candidates must ensure absolute adherence to rubrics of questions.
- Teachers should educate their pupils on the importance of numbering their answers correctly.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Note: [What were the requirements of the question? Did the candidates do well on this question? If not, how did they understand it? As much as possible give figures, example: “50% of the candidates performed well on this question.”]

Question 1

The following mixtures were provided in the laboratory:

- (i) *iron fillings and sand;*
- (ii) *crystals of iodine and charcoal.*

Outline the steps that will be taken to obtain pure samples of the iron fillings and iodine from the mixtures.

This question required candidates to outline the steps that should be taken to obtain pure samples of iron fillings and iodine from mixtures of

Candidates’ performance in this question was very poor. In fact it was the worst answered question in the entire paper. Only about 20% of candidates did well in this question. The reason for this poor performance is due to candidates’ failure to write the steps in the correct order. Both students and teachers should know that in answering questions of this type, the steps must be presented sequentially. For example, the first step cannot be, the iron fillings will be attracted to the magnet when you have not mentioned the idea of spreading the mixture and passing the magnet over the mixture. In a similar way, candidates stated their first step as; the iodine will sublime instead of putting the mixture in a container and heating it as the first steps. Despite the weakness described above, candidates knew the names of the methods of separation for the mixtures.

Question 2

*The time, t taken and the distance, x moved by an object from points **A** and **B** are shown below in **Fig. 1 (a)** and **Fig. 1 (b)** respectively.*

*Study the diagrams in **Fig. 1 (a)** and **Fig. 1 (b)** carefully and answer the questions that follow.*

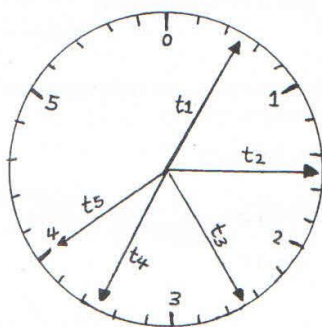




Fig. 1 (b) Distance moved

Scale: 1 cm = 5 m

- (a) Measure and record the distances: AX_1 , AX_2 , AX_3 , AX_4 and AX_5 and the corresponding times t_1 , t_2 , t_3 , t_4 and t_5 . Present your answer in the table below.
Copy and complete the table below.

Distance, x		Time
Raw value, x (cm)	Converted value, X (m)	

- (b) Draw a graph of converted value, X on the vertical axis against the time, t on the horizontal axis.
(c) (i) Determine the slope of the graph.
(ii) What does the slope represent?

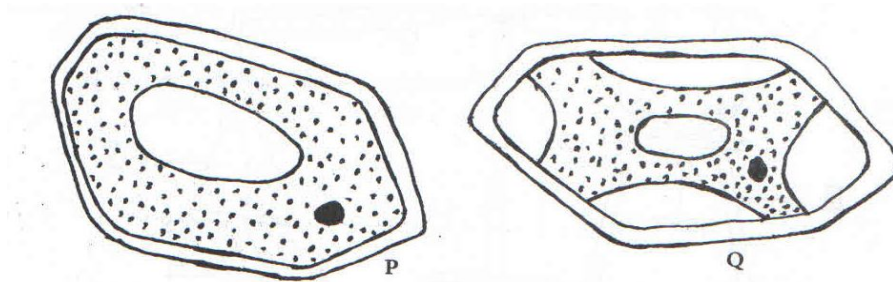
This question required candidates to measure distances AX_1 , AX_2 , AX_3 , AX_4 and AX_5 and the corresponding times t_1 , t_2 , t_3 , t_4 , and t_5 for an object that moved from points A to B. From the graph, the candidates should determine the slope and state what the slope represented. About 50% of the candidates did well in this question. Their strong areas are,

- Reading the time taken from **Fig. 1 (a)**
- Conversion of the distances from centimetres to metres as required by the question. Even candidates that got the measurements wrong, were able to convert these wrong measurements correctly.
- Plotting the graph and calculating the slope.
- The weaknesses of candidates in this question were,
- Failure to measure the required distances. For example, some candidates measured the distance between X_1 and X_2 instead of A and X_2 .
- Failure to state what the slope represented. Majority wrote velocity instead of speed. Effort should be made to distinguish between speed and velocity during the teaching and learning process.

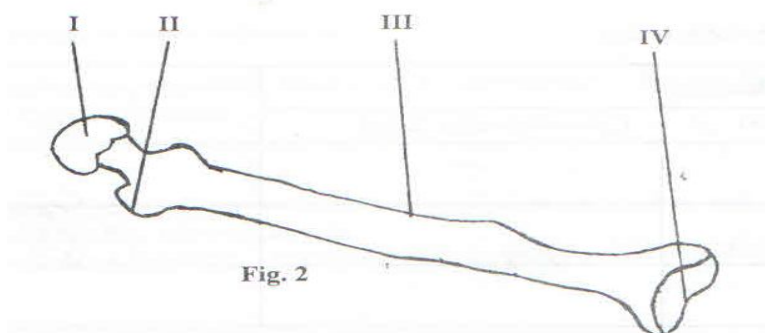
Question 3

- (a) The diagrams below represent two cells **P** and **Q** from two pieces of onion tissue. **One** of the onion pieces was mounted in water and the other in salt solution for about **ten** minutes.

Study the diagrams and answer the questions that follow.



- (i) Which cell from the tissue was mounted in water?
- (ii) Describe the appearances of cells **P** and **Q** after ten minutes and give a reason in **each** case.
- (b) Fig. 2 is an illustration of a bone in the mammalian skeleton. Study the figure carefully and answer the questions that follow.



- (i) Name the parts labelled **I**, **II**, **III** and **IV**.
- (ii) What is the function of the part labelled **II**?
- (iii) What type of joint does **I** and **IV** form with other bones?
- (iv) Name one part **each**, in the human body, where the type of joint formed by **I** and **IV** with other bones can be found.

The first part of this question required candidates to observe two pieces of onion cells **P** and **Q**, one mounted in water and the other in salt solution for about ten minutes. Candidates were asked to,

- (i) state which cell was mounted in water?
- (ii) describe the appearances of the two cells after ten minutes and give a reason in each case.

The second part of the question was about the diagram of a bone in the mammalian skeleton. The candidates were required to,

- Name the parts labelled **I**(head), **II**(trochanter), **III**(shaft) and **IV**(condyle),
- State the function of part **II**,
- State the type of joints parts **I** and **IV** form with other bones and
- Name one part each, in the human body where the types of joint formed by **I** and **IV** with other bones can be found.

Candidates did well in this question. About 60% of the candidates scored more than half of the total marks allocated to this question. The strong areas of candidates in this question were as follow-,

- Stating the cell which was mounted in water: The expected answer is **P**.
- Stating the reasons for the appearances of cells **P** and **Q**: The expected answers are, cell **P** absorb water and cell **Q** lose water.
- Identification and spelling of the parts **I** and **III** of the bone
- Naming of the part in the human body where the types of joints are found: The expected answers are, ball and socket found at the shoulder or hip and for the hinge joint at the knee or elbow.

The weaknesses of the candidates were as follow.

- Describing the appearance of the cells after ten minutes. Clearly, candidates did know the scientific process being tested, but did not know the technicalities involved. Instead of stating that the cell **P** becomes turgid, they stated the cell increased in size. It should be noted that this is a plant cell and the cell wall cannot allow it to increase in size. Similarly for cell **Q**, candidates stated that the cell decreased in size instead referring to the cytoplasm shrinking or reducing in size. Teachers should endeavour to make this technical point clear to the students. An animal cell can increase or decrease in size when exposed to these conditions because it is only bounded by a cell membrane.
- Identification and spelling of the parts labelled **II** and **IV** of the bone.
- Naming of joint formed by **I** and **IV** with other parts of the human body. Candidates failed in this question because, majority of the candidates wrote one joint, (eg, ball and socket) without indicating if it is for part **I** or **IV**. This is a serious mistake on the part of the candidates. Failure to number or clearly identify answers can be costly. This same scenario was repeated in the last question.
- Inability to spell the labelled parts of the vertebrae correctly. For example, part **I** was written as neutral spine instead of neural spine.
- Inability to spell the vertebrae correctly. For example, thoracic was spelt as thoracic and lumbar as lumber.

Question 4

Fig. 3 is an illustration of the set-up used to separate a mixture of ethanol and water. Study it carefully and answer the questions that follow.

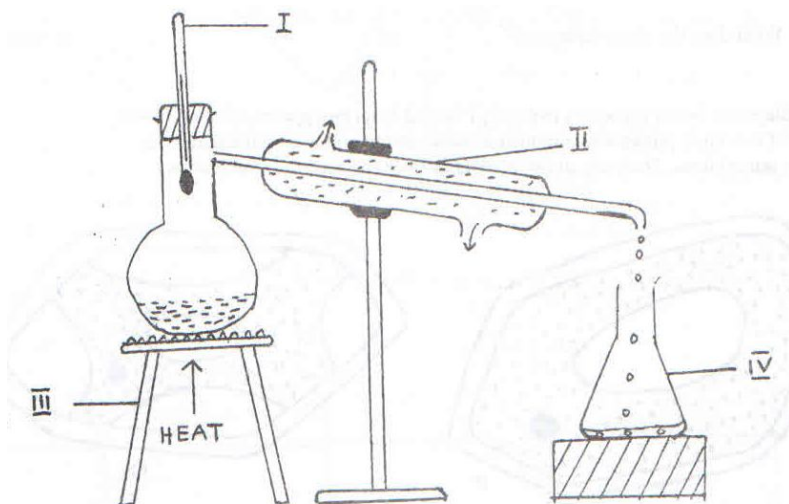


Fig. 3

- (a) (i) Name the parts labelled **I**, **II**, **III** and **IV**.
 (ii) Name the process of separation the set-up illustrates.
 (iii) State the role of the part labelled **II** in the separation process.
- (b) (i) Name the substance that was collected first in the part labelled **IV**.
 (ii) State the reason for the answer in 3(b)(i).
 (iii) Explain how you can tell when all the substance has distilled off.
- (c) (i) Describe how the purity of the substance could be checked.
 (ii) State **two** practical applications of this method of separation.

This question was about a set-up used to separate a mixture of ethanol and water. The part (a) required candidates to,

- name the parts labelled **I** (thermometer), **II** (condenser), **III** (tripod stand) and **IV** (conical flask).
- name the process of separation the set-up illustrates and;
- state the role of part **II** (condenser) in the separation process.

In part (b), candidates were to,

- name the substance that was collected first in the part labelled **IV**
- state the reason for the answer in (b) (i) and
- explain how you can tell when all the named substance in (b)(i) has distilled off.

In part (c), candidates were to;

- describe how the purity of the substance named in (b)(i) could be checked and
- state two practical applications of this method of separation;

The performance of candidates in this question is about 50%. Their strong areas include,

- (i) identification of the parts **I**, **II**, **III** and **IV**;
- (ii) naming the process of separation (i.e. distillation) illustrated by the set-up and
- (iii) stating the application of the process of distillation.

The weaknesses of candidates include;

- (i) Wrong spelling of the parts labelled **I, II, III** and **IV**
- (ii) Inability to state the role of the condenser in the separation process: Most candidates stated that it is to cool down vapour rather than the condense vapour. Others stated that its role is to condense water or ethanol instead of water vapour or ethanol vapour.
- (iii) Inability to state the reason why ethanol was collected first.
The expected answer is, ethanol has lower boiling point than water.
- (iv) Inability to explain how you can tell when all the has distilled off: The expected answer is, when the temperature rises above 78° C.
- (v) Inability to describe how the purity of ethanol collected could be checked: The expected answer is, to measure its boiling point.

Question 5

(a) *In testing for a certain food substance, the following steps are required.*

- I. Heat the test tube until the content boils.*
- II. Pour a little of the sample into the test tube.*
- III. Brick-red precipitate appears*
- IV. Pour a little Benedict's solution into the test tube*

(i) *Re-arrange and copy the above steps in the order in which they should occur.*

- (ii) Which food substance could be tested by using the above steps?*
- (iii) Which alternative reagent could be used in place of Benedict's solution?*
- (b) *A student place a few drops of iodine solution on a piece of bread.*
 - (i) What observation is the student likely to make?*
 - (ii) What conclusion could be drawn from the observation in 5(b)(i)?*
 - (iii) The student chewed another piece of bread and transferred it onto a watch glass and then added a few drops of iodine solution. State what the student is likely to observe.*
 - (iv) What conclusion could be drawn from 5(b)(iii)?*

(c) *Fig. 4(a) and Fig. 4(b) are illustrations of parts of the mammalian skeleton.*

Study them carefully and answer the questions that follow.

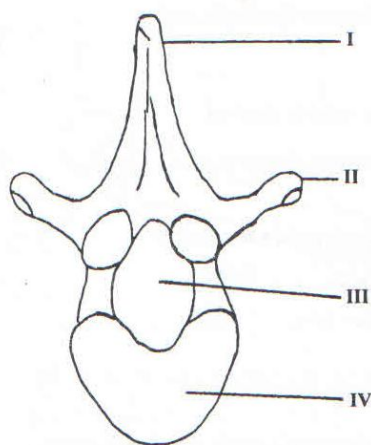


Fig. 4(a)

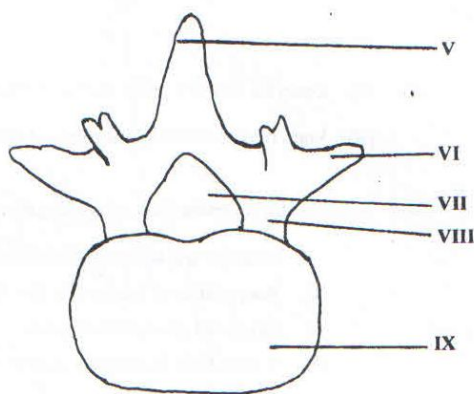


Fig. 4(b)

- (i) Identify **Fig.4(a)** and **Fig.4(b)**.
- (ii) In which part of the human body can the structure in **Fig.4(a)** be found?
- (iii) Name the parts labelled **I,II, VIII** and **IX**.
- (iv) Give three differences between the structure in **Fig.4(a)** and **Fig.4(b)**.

The part (a) of this question was about the steps used in testing for a food substance. The question required candidates to:

- re-arrange the given steps in the order they should occur;
- state which food substance that could be tested using the steps and.
- state which other reagent that could be used in place of Benedict's solution to test for the said food substance

Part (b) is about a student placing a few drops of iodine on a piece of bread. Candidates were required to:

- state the observation the student is likely to make;
- the conclusion that could be drawn from the stated observation;
- state the observation the student is likely to make after chewing another piece of bread and adding few drops of iodine to it and;
- state the conclusion that could be drawn from such an observation.

Part (c) was about illustrations of two vertebrae labelled as Fig.4(a)(thoracic vertebra) and Fig. 4(b)(lumbar vertebra). Candidates were required to:

- identify the vertebrae;
- state the part of the human body each vertebra is located
- name the parts labelled **I**(neural spine), **II**(transverse process), **VIII**(neural arch) and **IX**(centrum).
- give three differences between the two vertebrae.

Candidates did fairly well in this question. About 60% scored more than half of the marks. The strong areas in which candidates did well are as follows

- Re-arranging the steps used in testing for a food substance: A good number of candidates did well in this part of the question.

- Stating the alternative reagent that could be used in place of Benedict's solution. The required answer is Fehling's solution: Despite some wrong spellings, candidates obtained all the marks to this part of the question.
- Stating the observation that the student is likely to make when few drops of iodine are placed on a piece of bread: The expected answer is the observation of a blue-black colour. Candidates really understood this test for starch. About 80% of the candidates got this right.
- Stating the conclusion that could be drawn from the observation above: The expected answer is the presence of starch. Candidates also did very well here.
- Naming the labelled parts of the vertebrae: Candidates were especially able to identify the neural spine, transverse process and the Centrum.
- Stating three differences between the vertebrae: Candidates did relatively well here. Even those who did not name the vertebrae were able to write the differences. However, it should be noted that differences of this nature should be structural rather than location or function.

Despite the strengths shown above, candidates showed weakness in the following areas:

- Stating the food substance that is tested using the re-arranged steps in part (a) of this question: The expected answer is reducing sugar or a named example (i.e. Glucose). Majority of the candidates either wrote sugar or carbohydrate.
- Stating the observation a student is likely to make when drops of iodine are placed on a piece of chewed bread: The expected answer is no colour change or brown colour is observed. The performance of candidates in this part was very poor. They did not understand the effect chewing has on the bread and went on to write the same blue-black colour or simply left it unanswered.
- Stating the conclusion that could be drawn from the observation above: The expected answer is the starch in the bread has been changed to maltose or the starch has been broken down or digested. This is the part in the whole of question five majority of the candidates either scored zero or did not attempt it.

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
COMMERCIAL SUBJECTS

1. STANDARD OF THE PAPERS

All the Chief Examiners for the commercial subjects indicated that the questions set were within the scope of the syllabuses and can be compared favourably with the previous years.

2. CANDIDATES' PERFORMANCE

The Chief Examiner for Business Management reported that there was a significant improvement on candidates' performance compared to the previous years. However, the Chief Examiners for Commerce, Financial Accounting and Principal of Cost Accounting reported a woeful drop on candidates's performance compared to the previous years. This might be attributed to the ill-preparedness of candidates leading to their inability to understand and accurately interpret the questions.

3. CANDIDATES' STRENGTHS

Generally, few candidates demonstrated the following strengths:

- Ability to present correct and legible work.
- Ability to interpret the questions.
- Ability to recall definitions of terminologies.

4. CANDIDATES' WEAKNESSES

Candidates' weaknesses were reported as follows:

- Inadequate coverage of the syllabus.
- Ill-preparation for the examination.
- Poor command of the English Language.
- Inability to follow the instructions.
- Misinterpretation of questions.
- Inability to differentiate key words like -state, explain, list and define.
- Poor understanding of technical terminologies.
- Poor presentation of work.

5. SUGGESTED REMEDIES

The Chief Examiners gave the following suggestions to improve on performance:

- Candidates should endeavour to complete the syllabus.
- Students should be encouraged to read and understand examination's instructions before answering questions.
- Candidates should make use of prescribed text books.
- Candidates should read extensively and write to improve on the use of the English Language.
- Teachers should give regular assessments to have a feedback on each topic taught.
- The teaching syllabus for Commerce should be reviewed.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
BUSINESS MANAGEMENT 2

1. GENERAL COMMENTS

The standard of the paper met the WAEC New syllabus standard. All the questions were well set and self-explanatory. The marking scheme was very clear and easy to follow. Candidates' performance showed a significant improvement over the previous years. The number of candidates who scored zero decreased significantly.

However, about 15% of the candidates paid little or no attention to instructions on the question paper and therefore just wrote their answers without any sense of direction.

2. CANDIDATES' STRENGTHS

The Chief Examiners reported candidates' strengths as follows:

- Clarity and legibility of work.
- Ability to produce definitions.
- About 60 % of the candidates followed instructions.
- About 65% of the candidates from new centres demonstrated a high degree of knowledge in the subject matter.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported candidates' weaknesses as follows:

- Inability to follow the instructions for some candidates.
- Failure to number the answers for some candidates.
- Some candidates were ill-prepared for the exam.

4. SUGGESTED REMEDIES

- Candidates should endeavour to read instructions and questions thoroughly.
- Candidates and Teachers should endeavour to cover the syllabus.
- Candidates should be adequately prepared for the examination.
- Candidates should read extensively and write to improve on the use of the English Language.
- Teachers should teach the distinguishing features of business units.

- Candidates should be taught examination techniques.
- Candidates and teachers should encourage students to do more research into their subject matter.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **four** questions in all. Question **1** and any other **three** questions.*

Question 1

Read the case below carefully and answer the questions which follow.

HOME TOUCH BANK LIMITED

The Home Touch bank Limited was established in 2009 Freetown, Sierra Leone. Its aim was to provide a wide range of financial services to the newly established fishing and processing companies located in the coastal towns of Shenge and Tombo and to other local fishing communities.

Between 2010 and 2014, the bank recorded high profits. Its reputation as a provider of variety of banking services soared. Customers were particularly delighted with the conditions attached to overdraft and concessionary loans in the purchase of fishing inputs.

The increase in demand for the bank's product made the directors to introduce a decentralization policy so that customers could be better served. Branch managers were allowed to take all decisions without referring to head office except on critical matters. Customers' requests were promptly attended to. The average waiting time to serve customers was significantly shortened. As a result of quick decision-making at the various branches, efficiency in service delivery was enhanced.

In 2015, the Board of Directors of the bank decided to take over most of the decisions made by branch managers. The branch managers were now to refer to Headquarters any loan request above ten thousand Leones for approval. All concessionary loans were also to be approved by the Head Office. By the end of 2015, the branch offices started experiencing drop in their customer level and staff turnover increase. Competition increased sharply as a result of three new banks entered the market.

- (a)
 - (i) *Explain decentralization.*
 - (ii) *State three benefits that the bank derived from decentralization.*
- (b) *List **four** services that could be provided by the bank.*
- (c) *State **three** factors that contributed to the initial success of Home Touch Bank Limited.*
- (d) *Suggest **three** recommendations that will help revive Home Touch Bank Limited.*

Though a compulsory question, about 1% of the candidates did not answer it.

- (a) (i) and (ii) were questions on Decentralization, requiring candidates to define the term and to state the benefits of decentralization to the Bank. About 65% of the candidates were able to give correct definition and benefits of Decentralization. About 20% of the candidates mixed up “Delegation” and “Decentralization.”
- (b) It was surprising to note that about 30% of the candidates were not able to state any correct functions of commercial Banks.
- (c) About 90% of the candidates were able to identify the correct answers in the passage.
- (d) Low marks were scored for this part because candidates were not able to come up with convincing reasons or ways of reviving the bank.

Question 2

- (a) *What is a product?*
- (b) *State and explain any **four** reasons for the failure of a new product.*

This was the most popular question answered by about 90% the candidates and the majority of them scored very good marks.

In part (a) candidates showed that they understood product as a marketing mix. About 50% were able to give correct definition of the term. However, others were not able to give correct definition. Some mixed up the definitions of “production” and “product.”

In Part (b), a considerable number of candidates performed fairly well. However, about 40% of them used their own ideas to answer the questions instead of what the question was demanding.

Question 3

Explain the following documents used in international trade:

- (i) *Export order;*
- (ii) *Bill of lading;*
- (iii) *Consular invoice;*
- (iv) *Certificate of origin;*
- (v) *Certificated of insurance.*

This was a popular question answered by about 72% of the candidates. About 20% of the candidates obtained marks above average. Disappointingly, only about 1% of the candidates gave correct definition of the term “EXPORT ORDER” and about 2% of the candidates correctly defined “CONSULAR INVOICE”.

In part (iii), it appeared that the candidates had no idea about the question. It was also noticed that the majority of those who scored low marks or no marks at all, presented irrelevant answers to the questions. Example, definition for 'certificate of origin' was written for 'Bill of exchange' etc.

Question 4

- (a) *What is a cheque?*
- (b) *Identify and explain the parties to a cheque.*
- (c) *Outline three essential features of a valid cheque.*

This was another popular question and it was attempted by about 95% of the candidates. About 60% of the given answers in connection with parts (a) and (b) were indeed good and attracted good marks. Others were able to identify the parties to a cheque but were not able to give correct definitions of what they identified. It is therefore essential for candidates not only to identify but to correctly define the parties to a cheque.

Part (c) was poorly answered. It was observed that candidates did not know the features of a valid cheque. It was also noted that many candidates wrote on the types of cheque, others on the importance of a cheque instead of the features as required by the question.

Question 5

- (a) *Explain **three** reasons for the failure of Public Corporations.*
- (b) *Stat and explain **three** advantages of limited liability companies.*

This question, based on business units, is a common topic but only about 60% of the candidates attempted it. They scored up to half of the total marks allocated to the question. Few candidates scored poor marks.

In Part (a), candidates were required to explain the reasons for the failure of public corporations. About half of them who attempted this question exhibited lack of knowledge of the various business units in the first place and therefore, did not give the correct answer. It is important to note that as much as there are many business organizations, each of them has its distinct characteristics and therefore specific reasons for its failure.

In part (b), Candidates were to explain the advantages of limited liability companies. Candidates gave a lot of points but most were not applicable to Limited liability companies and moreover other business units such as partnership etc.

Question 6

- (a) *What is leadership?*
- (b) *Explain three types of leadership styles.*
- (c) *Explain three sources of power available to a leader.*

This was another popular question. It was answered by about 75% of the candidates and the marks scored for part (a) and (b) were good – as candidates were able to explain correctly the types of leadership styles.

In part (c), about half of those candidates who attempted the question just listed the correct sources of power available to a leader but could not explain their points clearly while others gave wrong answers. This part was not as popular as part (a) and (b). It was like the topic was not treated or candidates did not study it. So, the candidates tried to use their own ideas to answer the question.

Question 7

- (a) *Explain the term economic integration.*
- (b) *Distinguish between common market and economic union.*
- (c) *Explain three causes of globalization*

This question was the most unpopular and just about 7% of the candidates attempted it. The major source of error was that candidates would not sequentially identify the levels of integration and therefore were not able to explain the two levels stated in the question. They wrote statements which were not near to the answers. This clearly showed that candidates did not prepare adequately.

Part (c) was totally avoided by the candidates. About 5% of the candidates who attempted it scored low marks.

Question 8

- (a) *What is corporate social responsibility?*
- (b) *State and explain four ways in which a business can be socially responsible.*

This was another unpopular question and was attempted by about 20% of the candidates. Only 5% scored marks above average. It therefore appears that most of the candidates were not prepared for the paper.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
COMMERCE 2

1. GENERAL COMMENTS

The Paper reflected the level of the candidates tested. The questions drawn were all within the scope of the syllabus. However, there was a remarkable drop in performance compared to last year's. The poor performance could be largely attributed to the ill-preparedness of candidates leading to their inability to accurately interpret and understand the demands of the questions.

2. CANDIDATES' WEAKNESSES:

Candidates' poor performance centered around their inability to correctly interpret the requirements of the questions. For instance, some candidates may only write a statement for questions that require explanations. It is also evidenced that about 75% of the candidates were not familiar with basic commercial terms used in business transactions. For example, a candidate would provide an explanation for bank overdraft.

3. CANDIDATES' STRENGTHS:

There was little evidence of outstanding performance in this examination. Nonetheless, those who prepared well were able to get a fair share of the marks allocated to the questions. The contents in their answers were much close to the marking scheme. Also candidates who fell in this category showed their strength in orderly presenting their answers with the use of appropriate commercial terms. Their scripts were almost perfectly readable. This is commendable.

4. SUGGESTED REMEDIES

- The teaching syllabus should be reviewed to reflect the new trends in the subject.
- School authorities should provide extra reading materials in their various libraries especially those recommended by The West African Examinations Council.
- Regular class exercises and assignments will also help to assess the students' level of understanding of each topic taught.
- Teachers should endeavour to cover all areas of the syllabus well ahead of the exams to give enough time for revision.
- Teachers are advised to revise past questions and discuss the answers with their students in class. This should be done alongside the normal teaching periods to enable students familiarize themselves with the standard of the questions.
- The use of the internet could keep the students abreast of the latest development in commerce.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **five** questions **only***

Question 1

- (a) *What is E-Commerce?*
- (b) *State four advantages and four disadvantages of privatization.*

This is a popular question. However 60% of those who attempted it could not record good scores. Most of the candidates defined commerce and not E-commerce “E-commerce is defined as the buying, selling and distribution of goods and services through electronic media/internet”. In most of the candidates definitions, the terms “electronic media or internet were missing. This rendered the definition of E-commerce incorrect and hence those who attempted this question lost all the 4 marks allocated. In a similar vein, question (1b) was also poorly answered. As 75% of the candidates could not discuss the advantages and disadvantages of privatization. Responses expected included: “increases government revenue, promotes efficiency, encourages foreign investments, etc.”

Question 2

- (a) *Define communication.*
- (b) *List **six** means of communication in business.*
- (c) *In what **four** ways is communication important to a business?*

Most of the candidates who attempted this question performed well in (a) and (b) but poorly in (c). In their attempt to discuss the importance of communication, some dilated on the functions of communication in general, failing to pay particular reference to its importance in business. Answers like ‘it brings the world into one global village, it makes people to communicate easily’, etc. were visible in most scripts. Required answers were, ‘communication helps in creating awareness for goods and services in the market, helps managers to make right decisions, useful in settling payments for business transactions etc.’.

Question 3

Explain the following retail outlets:

- (i) *department store;*
- (ii) *mobile shop;*
- (iii) *chain shop;*
- (iv) *mail order business;*
- (v) *supermarket.*

Many candidates responded to this question. However, the performances in (ii) and (iv) were not encouraging. About 90% could not state the features of mobile shops and mail order businesses. Some mentioned that a mobile shop is one where mobiles are sold and a mail order business is where postal services are carried out. Answers such as these attracted no mark. Some candidates who stated features of the retail units were out exhaustive in their responses thereby earning low marks.

Question 4

- (a) State **five** merits of co-operative societies.
(b) Explain **five** procedures to be followed in the formation of a Private Limited Company.

Most of the candidates refrained from answering this question. Also 95% of those who attempted it had very low scores. A major contributing factor for the poor performance is the nature of subsection (b) of the question. Looking at the scripts of most candidates, there was clear evidence that they never read about the procedures to follow in the formation of limited liability companies. They identified and discussed the documents needed in company formation instead, such as memorandum of association, articles of association, certificate of incorporation; and some highlighting the contents of prospectus. The latter document is peculiar in the formation of a public company only. Suggested answers include;

- Application for name search and reservation,
- Preparation of articles and memorandum of association,
- Preparation of declaration documents,
- Filing of documents with the Registrar of companies,
- Assessment of filed documents for the purpose of fee payment
- Payment of registration fee,
- Collection of certificate of incorporation.

Question 5

- (a) State **four** features of a warehouse.
(b) Explain **six** reasons why warehousing is important to a business.

90% of those who attempted this question were only able to score at most half of the marks allocated to it. It was very glaring that part (a) of the question was not understood by most candidates and therefore scored nothing in that section. Indeed, some candidates were very confused and mixed up the features of a warehouse with importance of a warehouse. The same answers were advanced for both sections (a) and (b). Features of a warehouse include;

- Convenient location- e.g. Near seaports, central markets, highways, etc.
- Adequate mechanical appliances and facilities for loading, unloading, and Refrigeration, etc.
- Spacious accommodation to facilitate easy movement of goods and equipment.
- Effective security arrangement should be provided to prevent theft and burglary.
- Availability of office space for administrative staff.

Question 6

- (a) Define advertising.
(b) Explain **four** demerits of advertising.
(c) Explain **five** different ways producers can create awareness for their goods and services.

Many who answered this question wrote the definition of advertising correctly as required in (a). However, the meaning of demerit could not be interpreted correctly; thus leading most of them to write wrong answers in answering part (b) of the question. The performance in section (c) was better, with few exceptions as a result of repetition of points. For example, 'journal, newspaper, and magazine all fall under Print Media, as means of creating awareness for products and they should not be treated as separate points. Also, radio, television, and cinema are all Electronic Media.

Question 7

Explain the following business terms:

- (a) *standing order;*
- (b) *bank draft;*
- (c) *legal tender;*
- (d) *money order*
- (e) *I.O.U*

To perform well in this question required that candidates covered a great proportion of the topic from which the question was drawn. Undoubtedly, about 80% of those who attempted it performed poorly. The question comprised a series of sub questions all drawn from the same topic- means of payments in home trade; were grossly misinterpreted. For instance; Bank Draft explained as 'the excess amount a bank allows a customer to withdraw more than his credit balance in his account; Money Order explained as 'an order made by a poster master to make payment to a named payee when the amount is large. All the responses were wrong. Candidates who provided answers such as 'Bank Draft is a cheque drawn on a bank by itself or its branch to guarantee payment', an 'IOU is a document prepared by the debtor and issued to the creditor acknowledging a debt' scored very good marks.

Question 8

(a) *Write the following commercial abbreviation in full:*

- (i) *C.O.D;*
- (ii) *C.I.E;*
- (iii) *F.O.B;*
- (iv) *E & O.E.*

(b) *The sale of a good costing Le 100,000 attracts a trade discount of 5% and a cash discount of 5%.*

You are required to calculate the:

- (i) *trade discount value;*
- (ii) *cash discount value;*
- (iii) *net account payable by buyer.*

Commercial terms and abbreviations are areas where the overall performances of candidates were badly affected.

This is partly due to spelling errors which is fundamental in awarding marks. The majority of candidates who did not do well in this question failed to give correct spellings of the abbreviated terms. C. I. F. is Cost, Insurance and **Freight** and not Cost, Insurance and **Fright**. Also, E & O. E. is not Errors and Omissions **Expected** but Errors and Omissions **Excepted**. In section (b), the calculation of trade discount was done correctly by many candidates, but they failed to deduct the value of trade discount to further calculate cash discount.

Also, failing to indicate the currency sign (Le) in the final values of trade discount, cash discount and net amount payable rendered all their calculations incorrect. This latter aspect is an area teachers have to pay special attention during their lessons.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
FINANCIAL ACCOUNTING 2

1. GENERAL COMMENTS

The questions were all within the scope of the syllabus and the level of the candidates. School candidates were very familiar with these topics and felt more comfortable with them except Errors and Suspense Account due to their lack of understanding of the Principles of Double Entry System.

Most of the candidates answered a maximum of four questions. Some candidates did not write anything while others copied some of the questions in the answer booklets.

The questions, (5), (7), and (8) appeared difficult for the majority of the candidates. Candidates who attempted question (5) lost some marks because they did not include 'narration' which the question was silent about. For question (7), the title of the account 'prepare: **Income Statement** for the year' made most of the candidates think that it was about '*Income and Expenditure Account*' instead of '*Trading, Profit and Loss Account*' and therefore, answered it likewise.

In section B, questions (6) and (9) were popular. Over 90% of the candidate attempted them and scored high marks apart from those who failed to include the '**Total Column**' which attracted a lot of marks but had not been openly indicated in the question.

The overall performance of the entire candidates who sat for the Financial Accounting had been extremely very poor compared to the previous years. Most of the candidates lacked in-depth knowledge of the topics from which the questions were drawn.

2. CANDIDATES' STRENGTHS

A small percentage or 20% of the candidates exhibited their sound knowledge and understanding in the application of some of the topics from which the questions were drawn. They displayed their skills in the methods they have chosen to answer the questions. Few candidates presented correct and legible work.

3. CANDIDATES' WEAKNESSES

It was observed that about 70% of the candidates had problem in reading and writing which could be seen from the answers provided in the theory and practice questions. Besides, wrong methods of presentations were used. Some Candidates failed to write what is required by the questions namely the account headings, different account names or headings.

4. SUGGESTIONS REMEDIES

- Qualified teachers should be employed to teach the subject.
- The system of mass promotion should be reconsidered if quality education is a targeted objective.
- Candidates should make use of the past papers.
- Teachers should make use of the Chief Examiners' reports as a resource to finding solution to some of the avoidable mistakes that are constantly repeated by school candidates each year.

- Teachers should give assessments and tests and mark them to correct candidates to avoid most of these mistakes and errors highlighted in the Chief Examiners' report.
- Teacher should also lay more emphasis on the theory part of Financial Accounting which is one of the weaknesses of candidates doing Financial Accounting.
- Teachers should endeavour to complete the syllabus.
- Candidates must read and strictly adhere to the rubrics of the papers in order to perform better.
- Candidates should strive hard to clearly express themselves in English Language. Their answers should be free from ambiguity.
- Exam instructions should be clear to guide students.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

THEORY OF FINANCIAL ACCOUNTING

*Answer **two** questions **only** from this section.*

Question 1

*(a) What **six** types of source documents?*

*(b) State **three** uses of subsidiary books.*

This question was attempted by 80% of the candidates. The question is sub-divided into three parts, (1a) that deals with **source documents** was poorly answered. (1b) is about **types** of source documents. Again, most candidates could not list a single source document. Many listed subsidiary books instead.

Part (1c) is the **uses** of source documents. On this part many were able to state relevant points or answers. The majority of the candidates scored low marks others scored zero mark.

Question 2

(a) What is a Bank Reconciliation Statement?

*(b) State **three** reasons for preparing a Bank Reconciliation Statement.*

(c) Explain the following terms:

(i) unrepresented cheques;

(ii) standing order;

(iii) credit transfer.

This question attracted the attention of the majority of the candidates. School candidates are usually familiar with this kind of topic. About 80% or more attempted it but many could not define or described what is Bank Reconciliation Statement. It was mostly explained to mean Bank Statement.

Besides, (2b) was a challenge to the majority of the candidates because they could not identify others reasons for which a bank reconciliation statement is prepared apart from stating that is to '*reconcile the cash book with the bank statement balance*'. (1c) required candidates to the explain the following terms, (i) unpresented cheques, (ii) standing order, (iii) credit transfer. Many found it difficult to express themselves despite their ideas.

Question 3

(a) *Explain the flowing terms used in not-for-profit making organisations:*

- (i) *accumulated fund;*
- (ii) *subscription in arrears;*
- (iii) *receipts and Payment Accounts;*
- (iv) *income and Expenditure Accounts;*
- (v) *entrance fees.*

(b) *Distinguish between shares and debentures.*

This question was drawn from the topic 'not-for-profit-making organisations. It was in two parts (3a) and (3b). It required the candidates to explain the following terms as used in the application of not-for-profit-making organisations accounts. The sub-questions (3a); (i) Accumulated fund; (ii) Subscription in arrears; (iii) Receipts and Payments; (iv) Income and Expenditure Accounts; and (v) Entrance fees, could not be explained properly.

Part 3 (b) was to test candidates' knowledge on '*Shares and Debenture*' by stating clearly some identify differences which they failed. About 30% of the candidates attempted it and scored very low marks or zero mark.

Question 4

(a) *List the **four** main groups of accounting ratios.*

(b) *Identify the accounting ratio which related to each of the following statements:*

- (i) *A return of GH10 net profit for every GH 100 invested;*
- (ii) *Goods are held on the average for a period of one month before they are sold;*
- (iii) *Trade debtors on average take a period of 33 days to settle their debts;*
- (iv) *Trade creditors on the average are paid within 44 days for credit purchase;*
- (v) *Gross profit of GH 40 is made on every GH 100 of net sales;*
- (vi) *Current assets is three times that of current liabilities;*
- (vii) *Liquid assets is twice that of current liability;*
- (viii) *For every GH 100 net turnover, GH 17 is made after deducting operational expenses;*
- (ix) *Profit covers interest payments 9 times.*

This question was not popular. It might be due to the lack of syllabus coverage before the examination. About 25% of the candidates attempted it and few of them scored some reasonable marks and the rest scored very poor marks.

SECTION B

FINANCIAL ACCOUNTING PRACTICE

Answer **three** questions **only** from this section.

Question 5

The trail balance of Delta Duwe enterprise failed to agree. The difference was entered in the suspense account.

The following errors were later detected:

- (i) *A sum of \$1000 received from Salako has not been posted to his account;*
- (ii) *The sales day books was under cast by \$560;*
- (iii) *Return outwards books was overcast by \$140;*
- (iv) *Discount received column in the cash book has been overcast by \$400.*

You are required to prepare:

- (a) *Journal entries to correct the errors;*
- (b) *Suspense Account.*

It was a very popular question considering that over 85% of the candidates attempted it. However, the general performance was very poor due to their inability to effect the relevant corrections in the *General Journal* and comment on the errors corrected. About 10% of them did prepare the *General Journal* with corrected entries and comments and drafted the *Suspense Account* as it required. This group scored the entire marks allocated.

Question 6

Idayah Limited is a manufacturing company.

The following balances were extracted from its records on 31st December, 2014.

<i>Stock on 01/01/2014:</i>	<i>Le</i>
<i>Raw materials</i>	<i>56,000.00</i>
<i>Work-in-progress</i>	<i>60,000.00</i>
<i>Finished goods</i>	<i>81,000.00</i>
<i>Purchases of raw materials</i>	<i>150,000.00</i>
<i>carriage of raw materials</i>	<i>7,500.00</i>
<i>Manufacturing wages paid</i>	<i>16,500.00</i>
<i>Factory wages accrued</i>	<i>4,000.00</i>
<i>Fuel for factory equipment</i>	<i>15,000.00</i>
<i>Depreciation of factory equipment</i>	<i>12,000.00</i>
<i>Sales of finished goods</i>	<i>500,000.00</i>

<i>Carriage outwards</i>	7,600.00
<i>General office expenses</i>	3,800.00
<i>Office salaries</i>	19,200.00
<i>Stock: 31/12/2014</i>	
<i>Ra\w materials</i>	40,000.00
<i>Work-in-progress</i>	64,000.00
<i>Finished goods</i>	72,000.00

Additional information:

Goods manufactured were transferred to sales department at cost plus 10%.

You are required to prepare the Manufacturing, Trading and Profit and Loss Account for the year ended 31st December, 2014.

This question also attracted the attention of the majority of the candidates. This was due to fact that the question was drawn from a topic, Manufacturing Account; which would have been covered. About 90% of the candidates attempted this question. Most of them did well except the very few who scored low zero marks. A handful of the candidates showed their mastery over the topic by way of clarity of expression and orderly presentation of relevant material.

Question 7

Dauda, a retailer, does not keep proper books of account. The following were balances in his books on January 1, 2013.

<i>Premises</i>	70,000.00
<i>Equipment</i>	8,200.00
<i>Vehicles</i>	5,100.00
<i>Inventory</i>	9,500.00
<i>Accounts receivable</i>	150.00
<i>Bank</i>	1,400.00

The summary of his bank statement for the twelve months period from 1st January, 2013 to 31st December, 2013 is as follows:

D

Money paid to the bank:

<i>Shop taking</i>	96,500.00
<i>Received form debtors</i>	1,400.00
<i>Additional capital</i>	8,000.00
<i>Payments made by cheque</i>	
<i>Inventory of vehicle</i>	70,500.00
<i>Delivery van</i>	6,200.00
<i>Maintenance of vehicle</i>	1,020.00
<i>Electricity and water</i>	940.00
<i>Store boys' wages</i>	5,260.00
<i>Miscellaneous expenses</i>	962.00

Additional information:

- (i) *Dauda paid all shop taking for the year into the bank apart from monthly drawings of D500.00 and miscellaneous expenses of D408.*

- (ii) He was owing D7,600.00 to supplies for inventory bought.
- (iii) The accounts receivable is to be treated as bad debts.
- (iv) Inventory was valued at D13,620.
- (v) Depreciation for the year was calculated as D720.00 for equipment and D1,000.00 for vehicles.

You are required to prepare:

- (a) Statement of Affairs as at 01/01/13;
- (b) Income Statement for the year ended 31st December, 2013 and
- (c) Bank Account.

This was the least popular question. Less than (15%) of the candidates attempted it. The question was drawn from the topic, 'Incomplete Records and Single Entry'. It was to test their understanding of preparing, Statement of Account, Trading, Profit and Loss Account (also known as, Income Statement Account) as used in the question and Bank Account. Many avoided it. Candidates who attempted it performed very badly. The Income statement was taken to mean an Income and Expenditure Account.

Question 8

Govu, Tuga and Kano are partners engaged in retail business, sharing profits and losses in the ratio 2:1:2 respectively.

The following are the details of the extracts from their books as at 31st January, 2013.

	Govu	Tuga	Kano
	GH	GH	GH
Capital	50,000.00	45,000.00	60,000.00
Current Acct.	20,800.00	(5,000.00)	8,500.00

Additional Information:

- (i) The firm's sundry assets were valued at CH 431,000.00.
- (ii) The firm was cash strapped and on 01/07/2013, Tuga advanced a loan of CH 100,000.00 to the partnership at the rate of 5% per annum. Interest was payable six monthly and was to be credited to his account.
- (iii) Govu and Kano were to receive salaries of GH 25,000.00 per annum each.
- (iv) The profit for the partnership before charging loan interest was CH 158,000.00 for the year ended 31st December, 2013. The loan was not repayable until after the year 2016.

You are required to prepare:

- (a) Profit and loss and Appropriation Account for the year ended 31st December, 2013;

(b) *Partners' Current Accounts in a columnar form.*

This question was drawn from Partnership Account as one of the topics in the syllabus. It was the least attractive question to the candidates. About 30% of the candidates attempted it. Their performance was very poor. They could not prepare the Appropriation Account and the Partners' Current Account properly.

Question 9

The following balances were extracted from the books of Emeka Company Ltd. for the year ended 31 December, 2016.

	Department	Amount ()
<i>Sales:</i>	<i>Cloth</i>	<i>68,000.00</i>
	<i>Dress</i>	<i>54,000.00</i>
	<i>Shoes</i>	<i>41,000.00</i>
<i>Purchases:</i>	<i>Cloth</i>	<i>44,800.00</i>
	<i>Dress</i>	<i>37,060.00</i>
	<i>Shoes</i>	<i>29,060.00</i>
<i>Electricity and water</i>		<i>3,570.00</i>
<i>Sales expenses</i>		<i>1,956.00</i>
<i>Commission paid</i>		<i>3,260.00</i>
<i>Printing and stationery</i>		<i>750.00</i>
<i>Wages and salaries</i>		<i>27,000.00</i>
<i>Miscellaneous expenses</i>		<i>6,900.00</i>
<i>Inventory 01.01.16</i>	<i>Cloth</i>	<i>12,430.00</i>
	<i>Dress</i>	<i>9,550.00</i>
	<i>Shoes</i>	<i>7,750.00</i>
<i>Inventory 31.12.16</i>	<i>Cloth</i>	<i>10,540.00</i>
	<i>Dress</i>	<i>7,350.00</i>
	<i>Shoes</i>	<i>8,280.00</i>

Additional information:

Expenses are to be apportioned between departments as follows:

- (i) *Sales expenses and commission in proportion to sales;*
- (ii) *Printing and stationery, and wages and salaries in the proportion 6:4:5 respectively;*
- (iii) *Other expenses equally.*

You are required to prepare a Department Trading and Profit and Loss Account for the year ended 31 December, 2016.

This question was attempted by over 90% of the candidates. It was the most popular among all the questions. The reason is that is drawn from a topic that interests most of the school candidates.

Despite the fact that most of the candidates made some mistakes in the presentation and failed to include the *total column*, some of them were able to score good marks.

**WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
PRINCIPLES OF COST ACCOUNTING PAPER 2**

1. GENERAL COMMENTS

The standard of the paper compared favourably with those of the previous years. The questions were unambiguous and within the scope of the syllabus. The number of candidates who sat for this exam in the Gambia was 270.

Candidates were examined in the following areas: Stock taking, Process Costing, Standard Costing, Interlocking and Integrated Accounts, Contract Costing, Manufacturing Accounts, Job Costing, Marginal Costing and Absorption Costing Techniques and Cash Budget.

The questions tested candidates in both theoretical and practical requirements in a fair proportion, as 40% of the marks were related to written (theory) questions. Fortunately, candidates performed better in the theoretical requirements as compared with the calculations.

Although the standard of presentation was good for high performing candidates, there are still some candidates who need to take greater care with their presentations in order to improve their marks. Some candidates compressed their answers onto one single page, rather than spreading out their answers in a more presentable fashion, making it difficult for examiners to read figures and calculations.

It is important that candidates number each question carefully. A small number of candidates did not write their answers in coherent style and, consequently, lost marks. The Performance of the candidates was generally below expectations.

2. CANDIDATES' STRENGTHS

Candidates who prepared and were ready for the examinations scored more than half of the total marks. Candidates with high understanding of costing principles and effectively completed the syllabus, scored high marks.

3. CANDIDATES' WEAKNESSES

Some of the candidates appeared not to have prepared for the examination and showed little or no understanding of the costing principles. The orderly and logical presentation of answers was below average blended with the poor command of the English Language.

A significant number of candidates did not perform well in the Practice elements of the questions especially question 9. Their presentation on this question was very bad and hence performed woefully poor. The selection of questions by candidates in this section was quite poor. A few candidates selected questions which were quite demanding and left the simple and straightforward ones. A few candidates attempted only two questions instead of three in section B.

4. SUGGESTED REMEDIES

- Candidates should be advised not to take the exams for granted.
- They should ensure that they take necessary steps to complete the syllabus and worked through series of questions before the exams.

- They should read and fully understand the questions before attempting them.
- Candidates should endeavour to follow the instructions. They are advised to attempt all the two and three questions required in section A and section B respectively.
- Candidates should endeavour to get recommended Cost Accounting textbooks and stop relying on pamphlets which are mere supplementary materials.
- Candidates should read extensively to improve their English.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

*Answer **two** questions **only** from this section.*

Question 1

(a) *List **five** duties of a storekeeper.*

Some candidates did not give the appropriate answer and were confused, stating the **duties of a storekeeper**. Although, many candidates generally demonstrated good understanding on **duties of a storekeeper**.

(b) *Explain the following processes:*

- (i) *periodic stocktaking;*
- (ii) *continuous stocktaking.*

Most candidates were able to explain periodic stock taking and continuous stock taking. However, some were engaged in mere repetitions which make them to lose marks.

(c) *State **two** advantages **each** of 1 (b) (i) and 1 (b) (ii).*

A good majority of the candidates were able to state advantages of periodic and continuous stock taking. Yet again, it is disappointing to report that only a minority of the candidates got the full marks.

Question 2

(a) *State **three** characteristics of process costing.*

(b) *List three causes of losses in process costing.*

(c) *Explain how the following are treated in Process Cost Accounts:*

- (i) *normal losses;*
- (ii) *abnormal losses;*
- (iii) *abnormal gains.*

Candidates did well in stating the characteristics of Process Costing and causes of losses in process costing.

The approach was quite poor for the part (c) of the question as candidates showed little understanding of the question on treatment in Process Cost Accounts of normal losses, abnormal losses and abnormal gains.

Question 3

(a) *Define Standard Cost*

(b) *Explain the **two** components of standard cost variance*

(c) *State **two** advantages and **two** disadvantages of standard costing.*

Very few candidates attempted this question and those who attempted it messed up. They could not define **Standard Cost** well. Most candidates appeared confused in the (b) part of the question and therefore could not explain the components of standard cost variance and some of them were merely listing different variances.

The approach to the part (c) of the question was not good either. Few candidates struggled to score the maximum mark.

Question 4

- (a) *Differentiate between Interlocking Accounts and Integrated Accounts.*
- (b) *State the three causes of differences between Cost Accounting Profit and Financial accounting Profit.*
- (c) *List **three** items each that appears in:*
 - (i) *Cost accounts **only**;*
 - (ii) *Financial Accounts **only**.*

Many candidates correctly dealt with differences between Interlocking Accounts and Integrated Accounts. Few other candidates mixed up the two. However, some candidates mixed up causes of differences between Cost Accounting profit and Financial Accounting profit.

SECTION B

PRACTICE

*Answer **three** questions **only** from this section*

Question 5

*On 1st January, 2016, Olele Limited was contacted by the Yada district Assembly to construct an office complex at a contract price of GH¢ 2, 250, 000. The company prepares accounts to 31st October **each** year. On 31st October, 2016, the following balances were made available.*

	<i>GH¢</i>
<i>Materials issued to site</i>	<i>484, 000</i>
<i>Materials returned from site</i>	<i>42, 000</i>
<i>Wages</i>	<i>210,000</i>
<i>Plant on site</i>	<i>288,000</i>
<i>Hired plant charges</i>	<i>216,000</i>
<i>Supervision</i>	<i>32,000</i>
<i>Sundry expenses</i>	<i>36,000</i>
<i>General contract expenses</i>	<i>190,000</i>

Additional information:

- (i) *depreciation on plant is $12\frac{1}{2}\%$ per annum;*
- (ii) *materials on site at 31st October, 2016 were valued at GH¢ 72, 000;*
- (iii) *value of work certified up to 31st October, 2016 is GH¢ 1, 200,000;*
- (iv) *cost of work completed but **not** yet certified was GH¢ 120,000;*
- (v) *cash received for work certified was GH¢ 990,000;*
- (vi) *estimated cost to completion is GH¢ 700,000.*

You are required to prepare the:

- (a) contract Account up to 31st October, 2016;*
- (b) Contractee's account;*
- (c) Statement showing expected profit on completion of the contract.*

The approach to the question was far below average. Most candidates showed little or no knowledge in the preparation of Contract Account. In some cases, the layout was poor and not to good accounting format. Marks were awarded to candidates presenting answers to good accounting format, including appropriate use of columns and sub totals.

Question 6

The following information was extracted from the books of Dombo Manufacturing Company.

	<i>Le</i>
<i>Direct materials purchased for production</i>	<i>250,000</i>
<i>Wages of factory machine operators</i>	<i>120,000</i>
<i>Factory rent and rates</i>	<i>50,000</i>
<i>Depreciation of machinery</i>	<i>20,000</i>
<i>Wages of machine cleaners</i>	<i>10,000</i>
<i>Carriage on purchased materials</i>	<i>10,000</i>
<i>Machine repairs</i>	<i>15,000</i>
<i>Warehouse wages</i>	<i>50,000</i>
<i>Royalties paid on production</i>	<i>25,000</i>
<i>Cost of special mould for products</i>	<i>45,000</i>
<i>Warehouse repairs and maintenance</i>	<i>10,000</i>
<i>Factory managers' wages</i>	<i>15,000</i>
<i>Lubricants for factory machinery</i>	<i>5,000</i>
<i>Insurance of factory machinery</i>	<i>10,000</i>
<i>Cost of hiring additional machines for factory</i>	<i>25,000</i>
<i>Factory cooling and lighting</i>	<i>5,000</i>
<i>Manufacturing wages</i>	<i>80,000</i>

You are required to prepare Dombo Manufacturing Company's cost sheet to show:

- (a) direct material cost;*
- (b) direct labour cost;*
- (c) direct expenses;*
- (d) prime cost;*
- (e) production overhead;*
- (f) total cost of production*

It was very disappointing to note how many candidates seemed incapable of attempting the preparation of Manufacturing Accounts. The performance showed that only few candidates showed good understanding and preparation of Manufacturing Accounts and were quite familiar with the preparation of Manufacturing Accounts.

Question 7

The following information was extracted from the production department of Fatao Company limited for the year ended 31st December, 2016.

Materials used	GH¢ 250,000
Labour hours worked	50,000
Direct wages	GH¢ 140,000
Fixed overheads charged to department	GH¢ 60,000
Variable overheads charged to department	GH¢ 40,000
Hours of machine operation	40,000

A job produced in the department recorded the following results:

Total direct materials used	GH¢ 5,000
Total direct wages	GH¢ 4,000
Machine hours	1,500
Direct labour hours	2,000

You are required to calculate,

- (a) the following overheads absorption rates:
 - (i) direct material cost percentage;
 - (ii) machine hour rate;
 - (iii) direct labour rate.
- (b) the cost of the job produced based on:
 - (i) direct material cost percentage;
 - (ii) machine hour rate.

About half of the candidates attempted this question. The candidates had some difficulty in working overheads absorption rates well. The approach to the question was slightly above average. Some candidates lost marks for the wrong formula. It is worth mentioning that candidates needed to recall the formulae which attracted some marks.

Question 8

Adenta Manufacturing company has the following information in its books for the year ended 31st December, 2016.

Sales 2, 000 units@ GH¢ 300	
Fixed factory overheads	GH¢ 150,000
Administrative cost	GH¢ 50,000
Variable selling and distribution overheads	GH¢ 100,000
Direct labour cost	GH¢ 60 per unit
Direct materials	GH¢ 60 per unit
Production units	GH¢ 2,500
Variable factory overheads	GH¢ 20 per unit

You are required to prepare a statement showing the profit or loss for the company using:

- (a) *marginal costing technique;*
- (b) *absorption costing technique.*

This could have been a bonus question, yet most of the candidates who attempted it could not prepare the Profit and loss statement using the Marginal and Absorption costing principles. Most candidates could not value or failed to value the closing stock in each case.

The performance of the candidates was barely unsatisfactory. Most of them did not know how to handle the questions and as a result of that performed poorly.

Question 9

Funke limited has made the following cash projectors for 2017 and 2018.

	<i>Dec. 2017</i>	<i>Jan. 2018</i>	<i>Feb. 2018</i>	<i>March 2018</i>	<i>April 2018</i>
	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>
<i>sales</i>	<i>20,000</i>	<i>22,000</i>	<i>25,000</i>	<i>24,000</i>	<i>30,000</i>
<i>purchases</i>	<i>12,000</i>	<i>15,000</i>	<i>18,000</i>	<i>18,000</i>	<i>20,000</i>

Additional information:

- (i) *50% of sales is for cash and the remainder is collected the next month with a 5% bad debt.*
- (ii) *60% of purchases are paid for in the month of purchase and the remainder paid the next month.*
- (iii) *the company receives a monthly rent of D 1, 500 and a dividend of d 3,500 is expected in March.*
- (iv) *equipment of D 8,000 will be bought in February 2018.*
- (v) *expenses of D 2, 000 which includes depreciation of D 200, is paid monthly.*
- (vi) *cash balance as at 1st January, 2018 is D550*

*You are required to prepare for the **first three months** of 2018.*

- (a) *schedule of receipts for sales:*
- (b) *schedule of payments for purchases;*
- (c) *a cash budget.*

This question was not popular among the candidates. About few candidates attempted it. Generally, the overall performance on this question was very disappointing and some candidates who attempted it showed that they lacked the knowledge in preparing cash budget.

HOME SCIENCE SECTION

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
HOME SCIENCES

1. THE STANDARD OF THE PAPER

All the chief examiners have reported that the standard of the papers was fair and they were within the scope of the syllabus.

2. CANDIDATES' PERFORMANCE

The Chief Examiners reported that candidates' performance was satisfactory in Foods and Nutrition and Clothing 3 (Practical). However, the performance of the candidates in Home Management, Clothing and Textiles 2 was poor.

3. CANDIDATES' STRENGTHS

The Chief Examiner for Home Management did not say much on candidates' strengths. However the Chief examiners for Clothing and Textiles and for Foods and Nutrition, had cited the following points as candidates' strengths:

- Candidates were able to improvise a solution (using the needle) whenever the sewing machine had a problem.
- Candidates were able to attach the bias binding.
- Candidates were able to make use of the sewing machine.
- Candidates were able answer four questions out of the six.
- Candidates were able to list the uses of legumes in the diet.
- Candidates were able to identify some of the cooking utensils in the diagram
- Candidates were able to list examples of dishes made from legumes using their local names.
- Candidates were able to finish on time.
- Candidates were able to interpret the questions properly.
- Proper serving dishes were used, and dainty portions were served.

4. CANDIDATES' WEAKNESSES

All the Chief Examiners cited the following points as candidates' weaknesses.

- About 25% demonstrated incompetency in the interpretation of the question chosen. They did not understand the mode of answering questions that bears key words like - state, explain, enumerate/list etc.
- Wrong spellings of words therefore give them different meanings.
- Lack of multi-tasking.
- Lack of time management.
- Lack of practical skills in most of the activities.
- Lack of good command of English language.
- Candidates were unable to illustrate using diagrams.

- The use of wrong terminology.
- Candidates were not able to finish on time (clothing & Textiles 3).
- Candidates were not able to do the embroidery.
- Casting stitch was a problem for some candidates.
- Making of the work loop was a problem.
- Incomplete coverage of syllabus for some candidates.

5. SUGGESTED REMEDIES

Below are some of the recommendations outlined by the Chief Examiners.

- There is need to organise in – service training/workshops/refresher course for Home Science teachers.
- Candidates should read beyond their text books. Supplementary books and the internet should be used as much as possible.
- Teachers should endeavor to cover the syllabus.
- Principals should support the teachers by providing a well-equipped lab.
- Any centre without a proper facility for practicals should not be allowed to offer the subject.
- All centres must prepare and cook inside for hygienic reasons.
- Candidates should be exposed to more practical works.
- School administration should employ qualified teachers, provide conducive environments for practical subjects and needed materials for course work.
- School candidates should make effective use of both the WASSCE home management teaching and examination syllabus before the examination period to acquaint themselves with all topics of the WASSCE Home management syllabus.
- Candidates and teachers should make use of Chief Examiners' reports and past question papers.
- Candidates should familiarize themselves with key words like list, enumerate, state, explain, illustrate, describe etc.
- Candidates should attend regular Home Management lessons before registering for the exams.
- Home management subject teachers should conduct practical lessons at schools in accordance with the syllabus only.
- Teachers should administer not only summative assessment but also internal practical assessment too to enable candidates acquire skills.
- Schools should provide remedial classes as motivational measures to assist candidates who are weak.
- School Administration should encourage the teaching of Clothing and Textiles from Grade 7.

**WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS REPORT
CLOTHING & TEXTILES 2**

1. GENERAL COMMENTS

The Clothing and textile paper 2 was on the whole a fair paper. The standard was good. Despite that the candidate's performance was as usual very unsatisfactory.

2. CANDIDATES' STRENGTHS

The Chief Examiner did not say much about candidates' strengths apart from mentioning that candidates were able to attempt four questions out of the six.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported candidates' weaknesses as follows:

- Candidates were unable to illustrate their answers using diagrams.
- Poor definitions
- Poor command of the English Language leading to poor construction of sentences and spelling mistakes.
- The use of wrong terminology.

4. SUGGESTED REMEDIES

- Candidates should endeavour to cover the syllabus before the examination.
- Teachers should have in-service training course.
- Principals should support the teachers and encourage students by providing a well-equipped lab and needed materials for course work.
- Candidates and teachers should make use of Chief Examiners' reports and past question papers.
- School Administration should encourage the teaching of Clothing and Textiles from Grade 7.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **four** questions **only***

Question 1

- (a) State four ways of identifying fibres.
- (b) (i) state six special finishes given to cotton fabrics.
(ii) list six absorbent fabrics suitable for a child's school uniform in the tropics.
- (c) (i) Explain two characteristics of linen fabrics that makes it suitable for a skirt.

(ii) State one important point to consider when laundering articles made from blends.

This question attracted 30 % of the candidates and less than 20 % of them scored marks ranging from 6 - 15.

In the (a) part, less than 1% of the candidates were able to explain ways of identifying fibres. The answer should have read:

- Absorbency
- Use of microscope
- Texture
- Feel and handling
- Observation
- Use of chemical/ alkaline.

In the (b) (i) part, candidates were not able to give the special finishes for cotton fabrics. 60% of the candidates wrote types of finishing in dress making eg. Seams, zipper, smocking, binding.

The answer should have read:

- Pre shrinking
- Sizing
- Napping
- Singeing
- Embossing
- Cease resistant finish
- Mercerizing
- Non ironing.

The (b) (ii) part was satisfactorily done. Candidates were able to list absorbent fabric for a child's dress as – poplin, teryln, twill, ghabadin, calico, rayon, denim, khaki, "hartum," "mbasen."

The (c) (i) was not well answered by the candidates. The answers should have read:

- Cool to wear
- Firm to handle
- Withstand high temperature
- Strong
- Smooth to touch

The (c) (ii) was poorly answered. It should have read:

- Follow laundering instructions for the weaker fibers.
- Follow instructions on care labels attached to the articles.

Question 2

- (a) (i) Explain the term seam.
- (ii) State **three** points that determines the choice of seam in clothing construction.
- (b) State the **five** general rules for working seams
- (c) State three points that affect the depth of seam allowance
- (d) With the aid of a diagram show the first stage in the making of an open seam.

This was one of the most popular question. 60% of the candidates attempted it and were able to score marks ranging from 4- 12.

The definition of seam should have read: seam is a process used for joining two or more pieces of materials neatly and securely.

The (a) (ii) part should have read:

- The fabric being used.
- The garment being made
- Position of the seam
- Shape of the seam

In the (b) part, 60% of the candidates were able to state the general rules for working seams as:

- Suitable thread should be used.
- Consider width of seam.
- Avoid puckered seam.
- All seam should be of similar width.
- Neaten seam as you go.
- Press seam stage by stage.

In the (c) part, the points that affect the depth of a seam allowance is as follows:

- Texture
- Quality
- Method of neatening
- Strength of fabric.

Question 3

- (i) State one difficulty that may be encountered when sewing jersey fabric
- (ii) Explain how to overcome the difficulty mentioned in (a) above.
- Describe how to test for colour fastness in fabrics.
- Give two examples each of the following:
 - (i) neatening stitches
 - (ii) joining stitches
 - (iii) decorative stitches
 - (iv) permanent stitches
 - (v) temporal stitches.

- *Sketch the front view of a dress showing fullness, suitable for a soft and pliable fabric.*

This question attracted 90% of the candidates. Only 20 % of them did not do well in it. Candidates were only able to answer the (c) part which read : give two examples each of the following:

- Neatening stitches e.g. loop stitch, machining, herring boning, zigzag, buttonhole stitch.
- Joining stitches e.g. running stitch, oversewing, ladder, back stitch, machining.
- Decorative stitches e.g. satin stitch, chainstitch, French knots.
- Permanent stitches e.g. running, back stitch, machining.
- Temporal stitches, e.g. even tacking, long and short tacking, diagonal taking, tailors tacking.

Question 4

(a) Classify pockets into three groups.

(b) (i) List six examples of pockets.

(ii) State three uses of pockets in garments.

(c) With the aid of a diagram, describe how to attach a pocket on a man's shirt.

40% of the candidates attempted this question and it was poorly answered.

The answers for the (a) part should have read:

- The patch pocket with or without flap
- The set-in pocket with special opening made in the garment
- The pocket incorporated into a seam
- Pocket cut in one with part garment.

The answers for the (b) (i) part should have read:

- Bound
- Flip
- Patch
- Welt
- Pocket set in seam
- Pocket with flap
- Hip pocket
- Slit
- Kangaroo pocket

The answers for the (b) (ii) part should have read:

- Functional
- Decoration
- As a disguise
- As a camouflage
- For warmth
- As a style.

Question 5

- (a) (i) Explain the term wardrobe planning.
(ii) explain two benefits of wardrobe planning.
- (b) State three characteristics of a well made hem opening on a front shirt.
- (c) State three factors that determine the choice of fastening when making garment.
- (d) Suggest two suitable fastening for each of the following:
 - (i) waistband of a skirt
 - (ii) wrap opening of blouse
 - (iii) Faced slit opening of a jumper.

This question attracted 80% of the candidates. Candidates were not able to give the definition of wardrobe planning.

Some gave an example of a definition as follows:

Wardrobe planning maybe define as the proper arrangement of clothes according to their colour and design.

The right definition should read: the process of carefully selecting and maintaining family clothing.

The answers for the (b) part should have read:

- Helps to save money
- Enables variety
- Helps to avoid buying the same clothing.
-

In the (d) part, candidates were able to give the suggestions of suitable fastening as follows:

- Button and button hole, hook and eyes, Velcro fastening for waistband of a skirt.
- Button and button hole, press studs, Velcro for wrap opening blouse
- Zips, eyelet, rouleau loops, buttons for faced slit opening for a jumper.

Question 6

- (a) Explain the term stain.
- (b) (i) List **four** types of stain
(ii) Give **two** examples of each stain mentioned in (b) above
- (c) Outline **six** general guidelines for removing stains
- (d) List **two** stain removal agents.

This question attracted 95% of the candidates and they were able to perform satisfactorily in it.

In the (a) part of the question, candidates were able to define stain as any discoloration found in a garment that is not originally part of it.

The actual definition read:

An unwanted spot that spoils the appearance of a garment/article.

The answers in (b) part of the question should read:

- Grease stain
- Vegetable stain
- Mineral stain
- Animal / protein stain.

In the (c) part, the general guidelines for removing should read:

- Remove the stain as soon as it occurs.
- Know the age of the stain.
- Know the nature of the stain.
- Know the type of fabric on which the stain is found.
- Test stain removal on an invisible part of the material.
- Start with the simplest method.
- Ensure that only the affected area is treated.
- Wash out any traces of the chemical used after removing stains.

The answers for the (d) part of the question should read:

- Water
- Soap/soapless detergents
- Kerosene
- Vinegar
- Pawpaw leaves
- Sunlight
- Salt
- Milk
- Turpentine
- Bleach

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINERS' REPORT
CLOTHING & TEXTILES 3

1. GENERAL COMMENTS

The Clothing and Textile practical exam was fair. The standard of the paper was good and the instructions were easy and straightforward. The candidature dropped this year compared to last year. The performance of candidates was satisfactory. They could have scored high marks if the instructions were read and carefully followed.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported candidates' strengths as follows:

- Candidates were able to improvise a solution (using the needle) wherever the sewing machine had a problem.
- Candidates were able to attach the bias binding.
- Candidates were able to make use of the sewing machine.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported candidates' weaknesses as follows:

- Most candidates were unable to finish on time.
- Candidates were not able to do the embroidery.
- Casting stitch was a problem for some candidates.
- Making of the work loop was a problem.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following measures as way of improving on performance:

- School Administrations should encourage the teaching of Clothing and Textiles from Grade 7.
- MoBSE should collaborate with WAEC to run in-service training courses for Clothing & Textiles teachers.
- Competent and qualified teachers should be appointed to teach the subject.
- Principals should support the teachers by providing a well-equipped lab and needed materials for course work..
- Candidates should be exposed to more practical works.
- Candidates and teachers should make use of Chief Examiners' reports and past question papers.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

PREPARATION AND CUTTING OUT

Question 1

You are expected to cut out and make a lady's purse so that the finished article will look as in Figure 1 and 2 below:



Front View

Figure 1

Back View

Figure 2

- (a) *Place the plain fabric and the gingham together, wrong side facing.
Lay it flat on the table.*
- (b) *Place pattern piece provided on the fabric, pin and cut out.*
- (c) *Transfer all pattern markings including all stitching lines indicated on section a and B.*
- (d) *Use the pattern provided to cut the foam material.
Don not transfer pattern markings*

One pattern piece was provided for a lady's purse. In the laying and cutting out of the pattern, 0% of the candidates were able to cut the pattern correctly. 50% couldn't handle the scissors correctly. The wrong type of scissors was used; it was either too small or too big to be handled.

80% of the candidates were able to transfer the pattern markings on the pattern to the fabric. The pattern markings were correctly interpreted by most candidates. The place on fold symbol was not followed by 20% of the candidates and as a result of that, the pattern pieces were more than required.

Too much time was wasted in the laying out and cutting out of the pattern.

This year 50% of the candidates used the correct carbon paper although it was the improvised type. Example, plain A4 paper with crayon.

MAKING UP

Question 2

- (a) *Place the foam material in between the plain fabric and the gingham, wrong sides facing and matching notches.
Paste the pieces together.*
- (b) *Tack along the stitching lines indicated on section A and B. Machine stitch. Press.*
- (c) *Bind all edges completely using the bias binding.*
- (d) *Fold section A cover section B with plain fabrics, facing. Pin and tack along this sides.*

- (e) *Using embroidery thread, join the sides together with over casting stitch.*
- (f) *Embroider your initials on the right side of section C of the gingham.*
- (g) *Fix the button on position.*
- (h) *Make a work loop to faster the button.*
- (i) *Attach **label***

In the (a) part which required the candidates to place the foam material the plain fabric and the gingham, wrong sides facing and matching notches and paste the pieces together, 90% of the candidates were able to follow this instruction and it was also properly pasted on the fabric.

In the (b) part, 60% of the candidates were able to tack along the stitching lines indicated on the fabric. Only 5% were able to press, (pressing would have given the purse the required shape).

In the (c) part, 90% of the candidates were able to attach the bias binding but unfortunately it wasn't properly done by 60% of them.

The (d) part which required the candidates to fold section **A** cover section **B** with plain fabric, facing and to pin and tack along the sides was comfortably and properly done by 85% of the candidates. They were able to fold the purse into the required shape.

In the (c) part, 60% candidates were not able to use the correct stitch indicated in the instruction. Instead of overcasting, running stitch was used to join the side seams.

The (f) part required the candidates to embroider their initials on the right side of section **C** of the gingham. 95% of the candidates did not do this section of the instruction.

In the (g and h) parts, less than 10% of the candidates were able to fix the button and make a loop as indicted in **G** and **H**.

The (i) part of the question which required candidates to attach label, was done by 95% of the candidates.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
FOODS AND NUTRITION 2

1. GENERAL COMMENTS

The Foods and Nutrition paper 2 was fair. All the questions were drawn from the syllabus and they were carefully selected from all the sections. Despite that, 50% of the candidates did not perform to expectation. The performance declined compared to the previous year.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported candidates' strengths as follows:

- Candidates were able to answer four questions out of the six.
- Candidates were able to list the uses of legumes in the diet.
- Candidates were able to identify some of the cooking utensils in the diagram.
- Candidates were able to list examples of dishes made from legumes using their local names.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported candidates' weaknesses as follows:

- Poor construction of sentences.
- Poor command of the English language.
- Difficulties in stating definitions.
- Unnecessary spelling mistakes.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions to improve on performance:

- In-service training/workshops/ refresher courses should be organized for Home Economics teachers.
- Candidates should read beyond their text books. Supplementary books and the internet should be used as much as possible.
- Teachers should make sure that the Foods and Nutrition syllabus is covered before the exams.
- Principals should support the teachers by providing well-equipped labs.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

- (a) What are legumes?
- (b) List the **two** classes of legumes and give one example for each class
- (c) Give **four** advantages of legumes in the diet.
- (d) List **four** dishes made from legumes.

This question attracted 90% of the candidates and they were able to perform satisfactory.

In the (a) part, the definition of legume was poorly answered by most candidates. 50% of them gave answers such as legumes are vegetables that are added to food, which made it wrong. The answer should have read: legumes are seeds of plants/ shrubs/ fruits that grow in long pods or shell which are eaten as food.

In the (b) part, candidates comfortably listed the classes of legumes and gave examples. They were able to score full 2 marks.

The classes of legumes are:

- Pulses and nuts
- Beans and oil seeds

Examples of legumes: pulses, beans, all nuts, peas, melon seeds, pumpkin seeds.

The (c) part that dealt with the advantages of legumes in the diet was poorly done by 80% of the candidates. The answer should have read:

- Serve as rich source of vegetable protein.
- Contain dietary fibre.
- Cheap source of protein.
- Provide rich source of protein for vegetarians.
- Can be used as an accompaniment to carbohydrates.
- Serve as a good source of energy, vitamins, iron, calcium.

In the (d) part, 90% of the candidates gave good examples of dishes made from legumes such as: “domoda,”” mbahal,”” mbassey ngebeh”, akara, plasas, |churah Gerteh” .

Question 2

(a) *state five reason for preserving foods*

(b) *List **two** methods of food preservation and give **two** examples of foods that can be preserved by **each** method.*

(c) *State two principles of preservation.*

40% of the candidates attempted this question and performed poorly.

In the (a) part, candidates were able to state reasons for preserving food as

- To prevent wastage
- To prolong shelf life.
- To prevent spoilage
- For easy packaging
- To make food available when they are not in season
- To provide variety

In the (b) section of the question, 90% of the candidates were able to list the following methods of preservation:

- Drying, e.g. fish, meat, vegetables
- Smoking, e.g. fish, fish
- Freezing, e.g. fish, meat, vegetables

In the (c) part of the question, less than 10% of the candidates were able to state the principles of food preservation.

The answer should have read:

- Destruction of microorganisms by heat.
- Removal of conditions favourable for growth of microorganisms.
- Prevent chemical reactions.

Question 3

(a) State **three** contributions of table appointments to meals.

(b) List **six** table appointments.

(c) In order of sequence, state **four** processes of washing up after clearing a table.

This question was attempted by less than 30% of the candidates. It was poorly answered by all the candidates.

The answer for the (a) part should have read:

- Informs the diner of the type of meal to be served.
- Beautifies the table.
- Improves the diners mood.
- Protects the table.
- Food is within the reach of the diner.

The answer for the (b) part should have read:

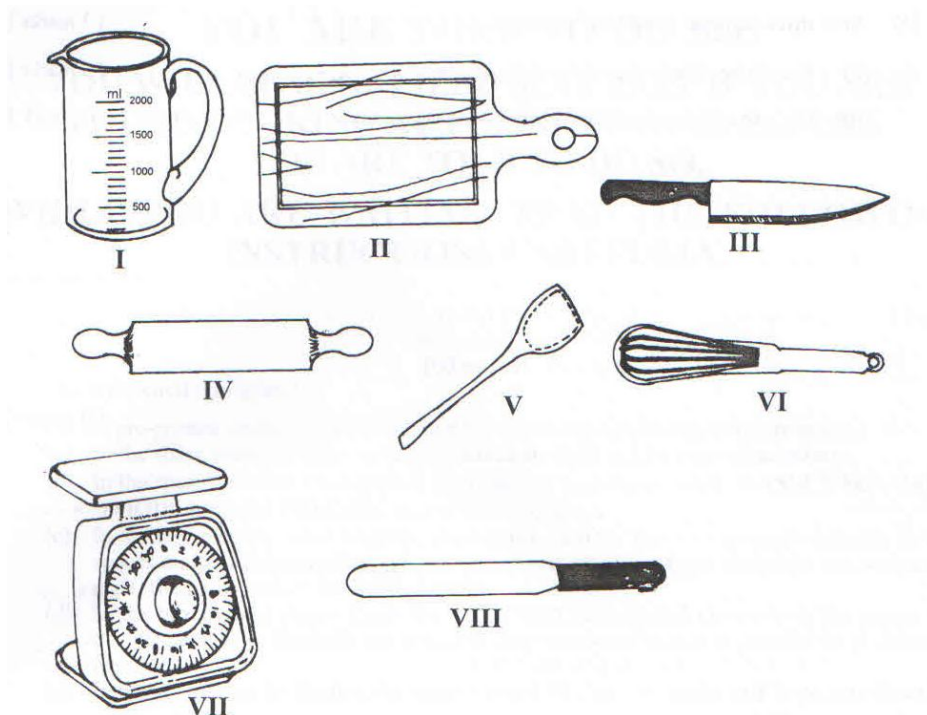
- Table linen e.g. table cloth, tray cloth, table runners, serviettes, drip mats.
- Center piece
- Glassware e.g., tumblers, wine glasses, jugs.
- Cutlery set e.g., flatwares, silver wares, dessert/ soup spoons.
- Crockery e.g., dinnerware, saucers, salad bowls, side plates, sweet bowls.
- Trays.

In the (c) part, the candidates couldn't give the answers in sequential order. The answer should have read:

- Prepare the washing up water, clear/ remove food particles from plates and wipe cutlery and plates with paper to remove grease.
- Wash, rinse and drain glasses and jugs.
- Wash, rinse and drain cutlery.
- Wash, rinse, and drain crockery, starting from the cleanest.
- Dry and store.

Question 4

The diagrams below are kitchen utensils. Study them and answer question 4.



- (a) Identify the utensils labeled **I-VIII** in diagrams above.
 (b) State **one** use **each** of any six of the utensils in the diagrams above.

This was one of the most popular questions. 85% of the candidates attempted it and were able to score marks ranging from 5 – 10. Only 25 % of the candidates could not identify the following utensils:

- I as measuring/ graduated jug
- II as chopping board
- V as spatula/ wooden spoon
- VI as egg whisk
- VII as palette knife.

In the (b) part, 60% were able to state the uses of the utensil in the diagram.

Question 5

- (a) (i) *define the term recipe*
 (ii) *list the **two** components of recipe*
- (b) *Explain **three** points to consider when selecting a recipe.*
- (c) *List **two** chief ingredients in the preparation of 'akara/koose'.*

50% of the candidates attempted this question and did relatively well. In the definition of a recipe in the (a) (i) part, most candidates couldn't define it well. Most of them didn't mention the method or steps to conclude the definition.

The definition of a recipe should have read: A list of ingredients, quantities and methods for preparing a dish.

In the (b) (ii) part, 60% of the candidates scored the full 1 mark. They were able to state the components of a recipe as:

- Ingredients and quantity
- Methods

The (b) part was not properly dealt with by 40% of the candidates as the answers they wrote were not for selecting recipes but rather for selecting vegetables.

The answer should have read:

- Money available
- Time available
- Skills of the cook
- Equipment
- Health status
- Age
- Sources .

The (c) part was well answered by 99% of the candidates,

Chief ingredients for ‘akara’ are:

- Vegetable oil
- Beans / bean flour.

Question 6

(a) State **three** functions of vegetables in the diet.

(b) State **three** purposes of cooking vegetables.

(c) (i) State **three** effects of cooking on vegetables.

(ii) List **two** conservative methods of cooking vegetables.

The (a) part was poorly answered by 40% of the candidates. Candidates misunderstood the question by writing points to consider when choosing vegetables. The answer should have read:

- Provide vitamins e.g. vitamins B and C.
- Give bulk to the diet.
- Provide variety in the diet.
- Supply water to the body.
- Improve colour, texture, flavor and appearance of meals.

In the (b) part of the question, the purpose of cooking vegetables should have read:

- To soften the fibre/ cellulose.
- To make the starch digestible.
- To preserve colour flavor and shape.
- To minimize loss of vitamin.
- To make it palatable.
- To stop the action of enzymes.

The effects of cooking on vegetable in the (c) (i) part of the question should have read:

- Gelatinization of starch.
- Change in colour.
- Improve flavor.
- Change in texture.
- Reduce bulk in vegetables e.g. leafy vegetables
- Softens the fibre.

The (c) (ii) part was misunderstood by most of the candidates; 50% could not understand what conservative method of cooking is and most of them were writing the methods of cooking which made it wrong.

The answer should have read:

- Stewing
- Steaming
- Baking
- Poaching.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
FOODS AND NUTRITION 3 (PRACTICAL)

1. GENERAL COMMENTS

The question was simple and clear and as well to the level of the candidates. It was drawn from the WASSCE Syllabus. Candidates performed to the best of their abilities and were able to complete the task at hand on time. Despite the lack of materials and facilities in some centres, candidates managed to perform to expectations.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Candidates were able to finish on time.
- Candidates were able to interpret the questions properly.
- Proper serving dishes were used, and dainty portions were served.
- Candidates did proper cleaning.
- All candidates put on aprons.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Wrong use of equipment.
- Wrong method of cooking for convalescent (stew).
- Candidates' inability to line a tray.
- Inability to follow the instructions for some candidates.
- The mixing of pastry was a problem for most of the candidates. Instead of dough most of them were making paste/batter.
- Poor command of the English Language.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Any centre without a lab for practical should not be allowed to present candidates for Home Sciences.

- All centres should prepare and cook inside for hygienic reasons.
- Candidates should be exposed to more practical works.
- School Administrations should employ qualified teachers.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question

A convalescent has been left in your care for a day.

(a) Prepare a mid-day morning snack.

(b) Prepare, cook and serve a two course lunch on a tray.

There has been a great improvement in some of the centres. Candidates gave the nutritive value but the suitability to the question still needed some improvement. Despite the improvement, some candidates did not line the tray whereas others placed food on the top of each other due to the use of serving materials that cannot fit on the tray.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINE'S REPORT
HOME MANAGEMENT 2

1. GENERAL COMMENTS

The standard of the paper compared favourably with those of the previous years. The questions were unambiguous and within the scope of the syllabus. The questions were derived from both the theoretical and practical topics within syllabus scope of the Senior Secondary Schools course programme of grade 10 to 12. The performance was poor compared to the previous year.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- 95% of the candidates chose 5 questions out of 6 as instructed on the paper.
- 98 % of candidates stated the numbers of the chosen questions on their answer booklets.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Incomplete coverage of the syllabus for some candidates.
- Misinterpretation of questions.
- Inability to differentiate key words like - state, explain, enumerate/list etc.
- Poor command of the English Language.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

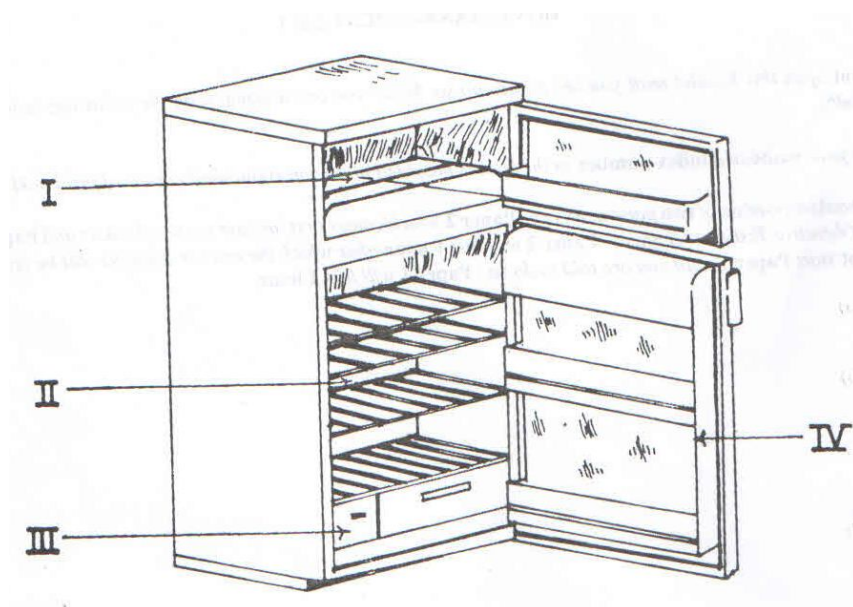
- Candidates should endeavour to cover the syllabus before the examination.
- Teachers should have in-service training course for Home Sciences.
- Candidates should read extensively and make use of the internet, supplementary books or journals.
- School administration should employ qualified teachers.
- School candidates should make effective use of both the WASSCE Home Management teaching and examination syllabuses before the examination period to acquaint themselves with necessary.
- Candidates and teachers should make use of Chief Examiners' reports and past question papers.
- Candidates should familiarize themselves with key words like list, enumerate, state, explain, illustrate, describe, etc.
- Candidates should attend regular Home Management lessons before registering for the exams.

- Homemangement subject teachers should conduct practical lessons at schools in accordance with the syllabus only.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **five** questions only*

Question 1



- Identify the parts labeled **I, II, III** and **IV**.*
- List **three** types of food that can be stored in the parts labeled **I** and **IV**.*
- State **five** guidelines for the use of the diagram above.*

The above question was popular but 90% of candidates did not know the names of the parts to be identified in (a). Most of them called the 'I' part chamber instead of freezer, the 'II' part cooler for middle shelves. The 'III' part tray/drawer instead of vegetable basket/tray/compartment and the 'iv' part fridge instead of refrigerator door/door only. The performance on the (b) part was also unsatisfactory. The types of food to be stored in 'I' was listed under 'v' and therefore made both of them wrong.

The performance on the (c) question was satisfactory because most candidates were able to state some guidelines for the use of the refrigerator like "to be clean regularly, to avoid touching with wet hands when it is on etc." However, most candidates responded to the uses and not guidelines.

Question 2

- Explain the **three** main types of vegetarians.*
- List **one** deficiency disease of the following food nutrients:*
 - Vitamin A;*
 - Vitamin B;*
 - Vitamin D;*

- (iv) *Calcium;*
- (v) *Iron;*
- (vi) *Vitamin B2;*
- (vii) *Sodium;*
- (viii) *Vitamin C.*

The above question was very popular. However, incomplete coverage and lack of mastery of the topic was manifested.

The (a) part of the above question was satisfactory. However, the explanation on the types of vegetarians was all mixed up. Some gave guessed names like non-vegetarians, lacto vegetarians, etc. Some did not give examples and mentioned the consumption of egg for lacto which was wrong and lost valuable marks for that section of the question.

In the (b) part, the performance was also unsatisfactory. Candidates were able to list deficiency diseases for vitamin A, B, C and D only but not for calcium, iron, vitamin B2 and sodium; the performance was very poor on those.

Question 3

- (a) *Define impulsive buying.*
- (b) *State **three** disadvantages of impulsive buying.*
- (c) *List **four** types of cooperative society.*
- (d) *State **three** advantages of cooperative society.*

A very popular question chosen by almost all candidates but their performance was unsatisfactory in the (a) and (b) section and very poor in the (c) where wrong response like 'traditional cooperative societies were given'. In the (d) part, candidates manifested their lack of knowledge of the topic. The question required the stating of the advantages of cooperative societies and not the rights of consumers or consumer education.

Question 4

- (a) *Define family.*
- (b) *Mention **six** factors that influence family relationship.*
- (c) *State **five** characteristics of a male adolescent.*

The above question was also popular. The performance in the (a) part was very good. Almost all candidates were able to score 1.5 points of the allocated 2 points. Inadequate responses in each section made them lose 0.5 to 1 mark. The performance in the (b) part was very unsatisfactory. Almost all candidates could not mention the factors that influence family relationship. Irrelevant answers like 'love, peace, trust, etc.' were given.

Question 5

With the aid of a diagram, explain the steps in home Management process.

A popular question that 90% of candidates chose and performed unsatisfactorily. This was an evidence that the topic was not covered or the candidates did not master the steps in the Home Management process of the topic. Some candidates could not arrange the steps in their logical sequences using arrows. Some attempted the diagram but left out the arrows to show the directions of the cycle/phases/ sequence of the steps.

Question 6

(a) Define the term seam

*(b) List **four** types of each of the following:*

(i) seam

(ii) decorative stitches

(c) Differentiate between temporary and permanent stitches

The above question was the least popular. Almost all the candidates that selected it performed unsatisfactorily. The only part that candidates tried was in the (b)(i) part where they were asked to list the types of seams. In the (a) part of the question on the definition of seams, none of the candidates scored 50% of the total marks for that section. Irrelevant and out of the topic responses were supplied. In the (b) (i) part, the wrong spellings of the decorative stitches gave their responses other meaning. Steam for stem stitch, not for French knots, hen for chain stitch, some mentioned Hemming which is a neatening stitch for decorative.

Candidates could not differentiate between temporary and permanent stitches in the (c) part. They gave irrelevant and wrong answers like: 'temporary stitches are for some time and permanent stitches are for long period, temporary stitches are temporary and permanent stitches are permanent, etc.' This was an evidence of non-mastery and misunderstanding of the terms that candidates should have interacted with in their grade 7-9.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
HOME MANAGEMENT 3 PRACTICAL

1. GENERAL COMMENTS

The standard of the paper compared favourably with those of the previous years. The questions were unambiguous and within the scope of the syllabus. The questions were derived from both the theoretical and practical topics within syllabus scope of the Senior Secondary Schools course programme of grade 10 to 12. The performance was poor compared to the previous year.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Candidates were punctual.
- Candidates manifested their interest and determination.
- Candidates followed the instructions.
- Candidates were able to mention the activities on the preparatory practical paper.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Lack of multi-tasking.
- Lack of time management.
- Lack of practical skills in most of the activities.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions.

- **Candidates** should be exposed to more practical works.
- School administration should employ qualified teachers.
- **School candidates** should make effective use of both the WASSCE Home Management teaching and examination syllabuses before the examination period to acquaint themselves with necessary skills.
- **Candidates and teachers** should make use of Chief Examiners' reports and past question papers.
- **Home management subject teachers** should serve as both facilitator and evaluator during teaching and learning activities.
- **Home management subject teachers** should conduct practical lessons at schools in accordance with the syllabus only.
- **Teachers** should administer not only summative assessment but also internal practical assessment to enable candidates acquire necessary skills.
- **Schools** should provide remedial classes to assist and motivate weak candidates.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question A

Clean the hall where the debate will take place.

Only the first set of candidates cleaned their halls thoroughly. The rest just swept and mopped the tiled floors of their halls without scrubbing.

Most of the candidates dusted the ceilings of their halls with brooms leaving some sections with cobwebs. Only 90% of the candidates dusted and wiped and cleaned their halls thoroughly. Only few candidates followed the logical sequences in cleaning their halls. There was a clear manifestation of candidates' lack of practical skills and experiences.

Question B

Clean and decorate the high table.

Most candidates just laid their table clothes on their tables and decorated them without dusting or wiping them. Others laid their table cloths, decorated their tables and then swept and mopped the floor leaving the decorated table dusty. The table cloths on most candidates' tables were inappropriate. Some candidates used net cloth, printed wrapper, lace material with one side's design and even the head ties. The table clothes of most candidates were hanging at different levels. Balancing as an element of design was not applied during the presentation of the set table. The decorations applied on the tables were also not balanced. Some used balloons and ribbons/garlands at one corner of the table only leaving the other corners plain.

Almost all the flowers used as centrepieces were dead and dried by the end of the practical exam because the vases and plates had no water. The flowers arranged on plates with sand were not covered with foil and that made the centre piece unhygienic for the table.

Question C

Launder your school uniforms that you will wear.

Almost 90% of the candidates did not sort their school uniforms especially where the uniforms were set of white blouse/shirt and coloured skirt/trouser. Almost 90% of the candidates did not observe the steeping step of their school uniforms. 90% of the candidates again just washed their school uniforms only once, rinsed once and dried. The usage of blue on white coloured blouses and shirts was very unsatisfactory. The blue solution was not strained in a blue bag and therefore left stains on the dry blouses/shirts. 98% of candidates pressed their school uniforms directly without dampening them for a smooth result.

Almost all candidates folded their school uniforms and not hanging them on hangers or over chairs.

Question D

*Prepare, cook and serve **two** snacks for the occasion.*

Candidates' performance on the above activity of the test was unsatisfactory. Practical skills in snack preparation were lacking. All the candidates demonstrated the following:

- One method of cooking applied on both snacks.
- Not varying the taste of the snacks by the preparation of one savoury and one sweet.
- Incomplete choice of snacks.
- Usage of wrong equipment in food preparation, cooking and serving.
- Incorrect proportion of chief ingredients used.
- Too much ingredients prepared, cooked and served, than economically required by the question.
- No aspect of gradual cleaning and clearing mentioned or demonstrated during the preparation and cooking process in the candidates' order of works / time plans until at the end of the whole exercise.
- Most candidates never mentioned the serving of their prepared snacks on their time plan.
- Most snacks were burnt due to overheating during frying.
- Most pies and pancakes were undercooked because of their size.
- Irregular shapes of snacks.
- 75% of candidates served their snacks with paper napkins instead of napkins.

TECHNICAL/VOCATIONAL SECTION

WASSCE FOR SCHOOL CANDIDATES, 2017
RÉSUMÉ OF CHIEF EXAMINERS' REPORTS
TECHNICAL AND VOCATIONAL SUBJECTS

1. STANDARD OF THE PAPERS

All the Chief Examiners reported that the standard of the papers of the various subjects was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. The rubrics were very clear and there was no evidence of time constraints.

2. CANDIDATES' PERFORMANCE

The Chief Examiners for woodwork 3, Visual Art 3B/C, Auto Mechanic 3, Metalwork 3, and applied Electricity 3 reported that the performance of the candidates was very impressive. The Chief Examiner for Visual art 3A reported that the candidates' performance declined when compared to the previous year. However, the Chief Examiners for Woodwork 2, auto Mechanic 2, Metalwork 2, applied Electricity 2, Visual Art 2, the Chief examiner for Technical drawing 2 and 3 reported that the overall performance of the candidates was poor.

3. CANDIDATES' STRENGTHS

The Chief examiners reported the following strengths:

- Ability to finish work on time.
- Ability to produce good work and to select correct tools.
- Ability to produce good quality line work and to demonstrate good knowledge in freehand pictorial sketch.
- Ability to use correct scale and the required dimension.
- Ability to follow the instructions.

4. CANDIDATES' WEAKNESSES

The Chief Examiners reported candidates' weaknesses as follows:

- Inability to cover the syllabuses.
- Inability to follow the instructions.
- Inability to label and put the required features.
- Lack of knowledge of the properties of some metals.
- Poor line work and wrong dimensioning.
- Inability to use some tools for some candidates.
- Poor visualisation skill.
- Lack of knowledge in Geometry drawing.
- Lack of knowledge in the three-speed sliding mesh gearbox and inability to calculate gear ratio.
- Inability to understand key words like - state, explain, list, etc.
- Poor coloured patterns.
- Lack of safety gear in the workshops.
- Poor command of the English Language.
- Lack of knowledge of machine work.

5. SUGGESTED REMEDIES

The Chief Examiners proposed the following suggestions:

- Candidates should be adequately prepared for the examination.
- Candidates should be exposed to more practical lessons.
- Teachers should endeavour to cover the syllabus.
- Teachers should put emphasis on marking out, filing and drilling exercise.
- Teachers should put more emphasis on the teaching of design and drawing.
- Teachers should use teaching aids in order to shape the visualisation strength of candidates.
- Art teachers should focus more attention on the teaching of colour and correct shading techniques.
- Schools should provide conducive environments for practical subjects and needed materials for course work.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
METALWORK2

1. GENERAL COMMENTS

The standard of the questions were most appropriate for the level of the grade 12 candidates. The five questions covered a lot of grounds on the metalwork syllabus and tested a wide variety of knowledge. Eleven schools did the examinations with a total of 239 candidates.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Candidates were able to answer all the five questions within the time frame.
- About 40% of the candidates were able to make very good sketches.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Some candidates found it difficult to label and insert the required features.
- Candidates (about 65%) were unable to state the properties of some metals.
- Candidates found it rather difficult to make proper sketches.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Teachers should put emphasis on the properties of metals which is an important sector of the Metalwork Syllabus.
- Candidates doing Metalwork should also do Technical Drawing.
- Candidates should have special drawing and sketching lessons.
- Teachers should endeavour to cover the syllabus.

- The identification of a sand casting drawing should be known and recognized by all candidates who followed the course for 6years.
- Candidates should have access to the following book: *Metalwork for schools*-J. N. Green; *Theory and Practice in Metalwork*- George Love.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **four** questions **only** from this paper.*

Question 1

- (a) *State the reason why files without handle should **not** be used.*
- (b) *Sketch an odd-leg calipers.*
- (c) *Describe the production of pig iron with reference to the following:*
 - (i) *furnace used;*
 - (ii) *charge;*
 - (iii) *impurities.*
- (d) *State **two** properties of each of the following:*
 - (i) *cast iron;*
 - (ii) *steel.*

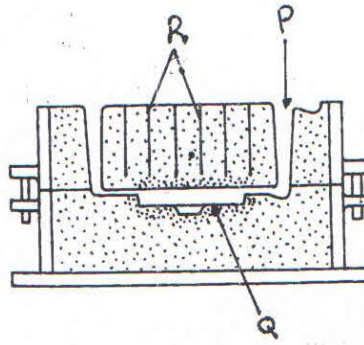
The (a) part of the question was one of the basic questions in the examination paper. Files must not be used without handle. If this is done, it will injure the user in his/her palm. Most candidates were able to answer it properly.

The (b) part of the question, the odd-leg caliper is another basic hand tool in the metal workshop. Candidates (about 45%) were unable to draw this tool which is a common tool in the metal workshop. The main features of the tool are the odd-leg and the 90 degrees feature of the straight leg. It was very vital for all the candidates to show these features.

The (c) part of the question, the production of metals and their properties was well answered by about 35% of the candidates but the rest could not even tell what the properties of metals were. The question was moderately answered by candidates.

Question 2

- (a) *The sketch below shows a profile of a sand mould.*



- (i) Identify the parts labelled **P**, **Q** and **R**.
- (ii) State the function of the parts labelled **P** and **R**.

(b) State **one** effect of **each** of the following operational examples:

- (i) using a pinned file;
- (ii) too great a cutting speed;
- (iii) too long a rivet tail;
- (iv) drill bit ground off-centre.

Candidates did not perform well at all on this (a) part of the question. The identification of drawings in the workshop was very important because it helps the worker to do his/her work accordingly.

The (b) part of this question was not properly answered by about 65% of the candidates. Filing and conditions of files should be known by all candidates attempting this examination. These are basic things that every candidate must know. The effect of long tailed rivet must be known by all candidates. Drill bit ground off-center will produce an over hole.

Question 3

- (a) (i) Explain the term design brief.
- (ii) State **two** reasons for writing specification in designing.

The performance on this part (a) of this question was poor. Design has always been a problem for the candidates sitting for the grade 12 examinations. Teachers must teach candidates about “design”. It counts a lot in any examination but most teachers seem not to be very familiar with it.

- (b) State **three** operations that can be carried out on the shaping machine.

Candidates performed badly in this part of the question. The shaping machine is not seen in any of the school workshop in the Gambia. Candidates know the theoretical aspects of this question but not the different operations.

- (c) *State the difference between speed and feed in turning operation.*

Candidates attempted then question but performed badly. Machining operations are also very important in metalwork and it is very prominent in the syllabus. The question on the lathe machine is just the same as the shaping machine. Teachers should teach machining in depth as covered in the syllabus.

Question 4

- (a) *State one reason each why the following heat treatment processes is carried out on metals.*
- (i) *Normalizing;*
 - (ii) *Annealing;*
 - (iii) *Case hardening;*
 - (iii) *Tempering.*
- (b) *State **one** function **each** of the following:*
- (i) *flux;*
 - (ii) *electrode.*
- (c) *State one safety precaution to be observed when welding with oxy- acetylene gas.*
- (d) *What is the filler metal for brazing?*

In the (a) part of the question, most candidates performed well. Heat treatment is a fundamental and basic topic in the metalwork syllabus. Teachers should give it priority so that candidates will treat it well. The different heat treatment processes must be a familiar topic for all the grade 12 students.

All the students should be familiar with topics such as soldering, welding and brazing and all the accessories. These are basic topics in joining. Teachers should give more time and attention to JOINTS and JOINING in metalwork. Some candidates did well on this question but not all

Question 5

- (a) *State **one** result of **each** of the following when working on the centre lathe.*
- (i) *Cutting tool set too high above the centre line.*
 - (ii) *Cutting tool set too low below the centre line.*
- (b) (i) *List **two** striking tools used in sheet metalwork.*
- (ii) *sketch any **one** of the tools listed in 5(b)(i).*
- (iv) *Label **two** parts of the tool sketched in 5(b)(ii).*

(c) *With the aid of a sketch, show the process of swaging in forging.*

This question dealt with lathe machine work. A very interesting topic but was not well treated by candidates. The different tool heights in lathe operations were not properly treated at all. We have very few workshops with this kind of machines.

Beaten metalwork is another interesting topic in the syllabus. Candidates made good sketches of the striking tools used and the swaging equipment used in sheet metalwork. Candidates made good sketches in use.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
METALWORK 3-PRACTICAL

1. GENERAL COMMENTS

The standard of the questions were most appropriate for the level of the grade 12 candidates. The questions were appropriate, within the scope of the syllabuses and compared favourably to those of the previous years.

The Metalwork 3 paper consisted of two practical exercises, out of which, one was to be attempted. One is a FITTING EXERCISE and the second, a MACHINING EXERCISE. The fitting exercise was chosen by all the candidates in the Gambia. The exercise covered most of the basic hand tools and their uses. The following operations were also addressed:

(1) Marking-out - Scribing

- Centre Punching
- Use of the Steel Rule
- Hack sawing
- Files and filing (different types)
- Hammers and hammering
- Rivets & riveting
- Drills and drilling machine
- Chiselling

(2) Filing - Different filing operations

The use of all these tools and equipment was a challenge to all the candidates because it required familiarity with their uses. The exercise was good and most candidates lived up to expectations. However, some failed to even understand the question and the drawings. Marking-out is one of the most important things in any practical work. If properly done, it would go a long way in helping the candidates to finish the assignment correctly. Some candidates did extremely well but others found it difficult to file to the required measurements. Looking at the work, it seemed that some candidates never did any practical work before much more using the tools listed above. Teachers should put more emphasis on the reading of drawings and the proper use of hand tools.

2. CANDIDATES' STRENGTHS

The Chief Examiner highlighted the following strengths:

- Most candidates (about 40%) did extremely well in the general use of the hand tools, machinery and equipment.
- Almost 30% of the candidates did well in the production of the three parts (A, B and C).

3. CANDIDATES WEAKNESSES

The Chief Examiner highlighted the following weaknesses:

- The marking-out was not properly done by most of the candidates.
- Most of the measurements done by the candidates were not correct and that led to poor practical work.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Candidates shouldnot be registered for the subject if the school doesn't have a metalwork shop.
- Teachers should concentrate more on marking-out, filing and drilling exercises.
- Teachers should put emphasis on the accuracy.

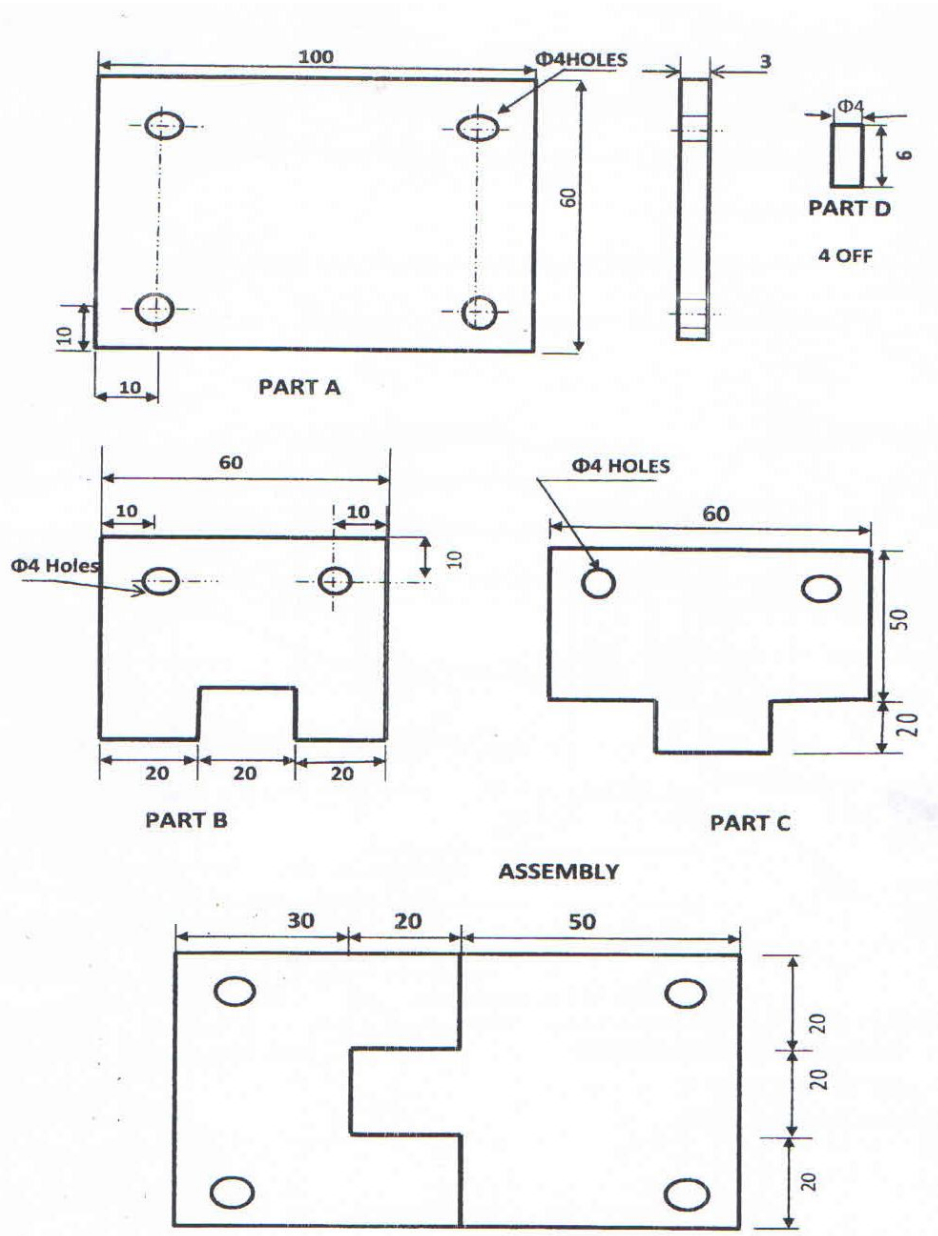
5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

The following materials are supplied:

- (a) **one** flat mild steel plate 102mm x 62 mm x 3 mm for part **A**;
- (b) **one** flat mild steel plate 62 mm x 3 mm for part **B**;
- (c) **one** flat mild steel plate 72 mm x 62 mm x 3 mm for part **C**;
- (d) mild steel rod 6 mm x \varnothing 4 (4 OFF) for part **D**;
- (e) **one** cotton bag, 150 mm x 100 mm;
- (f) **two** tie-one labels

The diagram below shows the assembly and detailed views of each part of a fitting exercise. Using the materials supplied, prepare the parts and assemble the pieces.



NOTE

1. Not drawn to scale
2. **All** dimensions in mm
3. Tolerance ± 0.1

The three parts(A, B and C) carried different marks though the tasks and challenges were the same. The tools used are the same and require a lot of concentration for accuracy. The positioning of the 4mm diameter holes on all the 3 parts was also a challenge but candidates did extremely well in tackling the tasks. Some candidates did extremely well in that; half a job well done carries good and equal marks also. For those who understood the diagrams and the dimensioning, they did extremely well. Marking-out is one of the most important tasks in any practical work as mentioned above. Once that was done properly, then the rest, with a little effort would be easy. About 40% of the candidates did well with the marking-out. Almost 30% of the candidates did well in the production of the three parts (A,B and C).

One thing, which was always a challenge to candidates, was the alignment of holes in different pieces of metals. Teachers should give more attention to accuracy and good finish in the practical work. The four holes were well drilled. The male and female joints in Parts B and C were also well done by over 30% of the candidates.

All the candidates demonstrated the proper use of files but the finishes were not very good at all. Considering the level of the candidates (pre-vocational), I can say that the candidates did well on average but more emphasis should be put on practical works.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
TECHNICAL DRAWING 2

1. GENERAL COMMENTS

The questions set for this year were within the scope of the prescribed WAEC syllabus. The standard was to the level of the candidates and the paper was well balanced paper. There overall performance of the candidates was poor compared to the past examination.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Ability to read and interpret orthographic drawing.
- Very few candidates demonstrated a good understanding of the questions
- Some skills in the use of basic drawing instruments such as the compass and set squares.
- A fair knowledge on the principles and theorem of development and triangular lamina.
- Candidates should endeavour to provide good quality line work.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Poor visualization with no awareness of what intersecting is about or could be.
- Some candidates could not project the pipe X on plan as 60 and square pipe Y on elevation as 30.
- The candidates demonstrated lack of knowledge in geometry drawing or projecting lines to complete the end elevation of the truncated cone.
- Many candidates could not copy the frame or required hexagonal prism and the triangular lamina using the right dimensions.

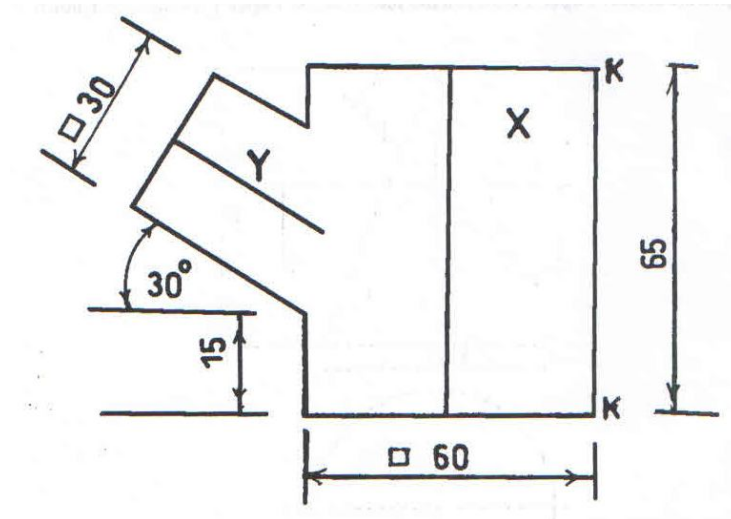
4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Candidates should be well-prepared and coached to master the rudiments of Technical Drawing in accordance with WAEC syllabus on time.
- Candidates should learn how to interpret orthographic drawing and the concept of a seam in terms of development.
- Teachers should put emphasis on triangular.
- Teachers should also try to cover a wide range of topics in the syllabus.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1



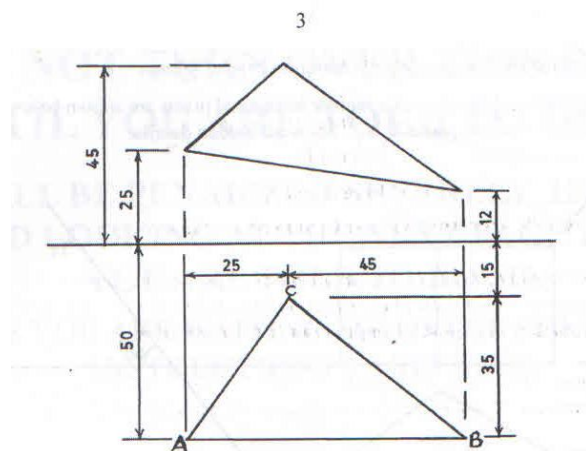
The figure above shows **two** square pipes **x** and **y** of unequal cross section intersecting at 30° .

Draw the:

- given view with the lines of intersection;
- complete plan;
- development of pipe **X** with **KK** as the seam.

The above question examined the knowledge, skills, development and visualization in the interpretation of two square pipes. Out of the many candidates who attempted this question, only a few did well. However, the question is not well dimensioned (i.e. The two square pipes are not dimensioned).

Question 2

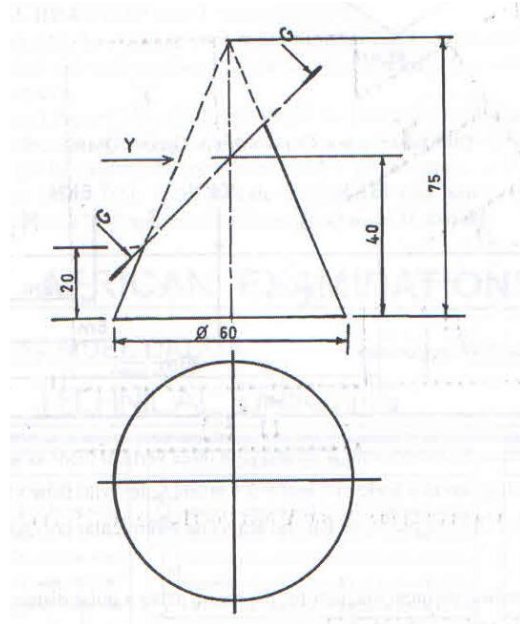


The figure above shows **two** views of a triangular lamina in first angle projection.

- (a) Copy the given views.
- (b) Construct the true shape of the lamina.
- (c) Measure and state the length of the three sides.

The above question tested the skills and knowledge of the candidates and is a major concern and needs to be addressed. This question is attempted by a few who only copied the frame work but could not answer it.

Question 3



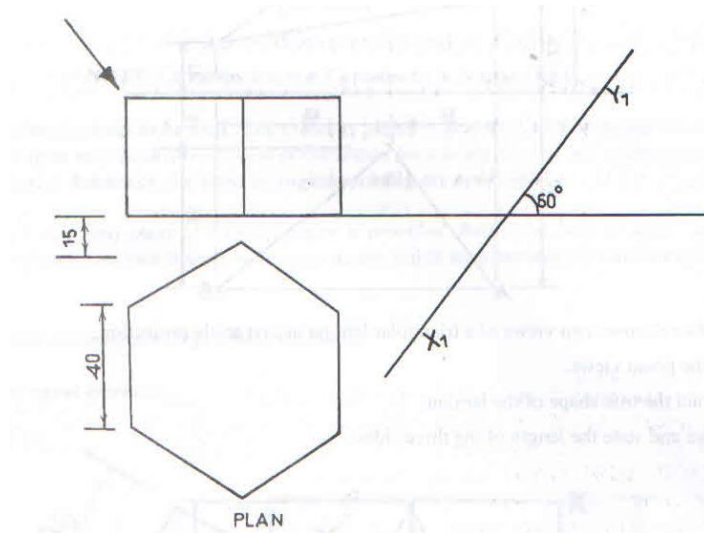
The figure above shows the front elevation and plan of a right cone cut by a plane **G-G**. Draw full size, the:

- (a) given elevation;
- (b) complete plan;
- (c) end elevation, looking in the direction of arrow **Y**.

The above question examined the skills and knowledge of candidates, and how to project the plan and end elevation of the frustum of a truncated cone. The question was attempted by many candidates, but only a few were able to draw and project the required views.

Question 4

- (a) Construct a square and a heptagon on a common base of 40mm.
- (b) The front elevation and the plan of a regular hexagonal prism are shown below. Draw the auxiliary plan on plane **X₁Y₁**. Show all hidden details.



Majority of the candidates attempted this question but only a few were able to draw the given frame and the inclined axis at 60° . The majority of the Candidates who answered 4a drew the heptagon and the square separately.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
TECHNICAL DRAWING 3

1. GENERAL COMMENTS

The questions set for this year were within the scope of the prescribed WAEC syllabus. The standard was to the level of the candidates and the paper was well balanced paper. The overall performance of the candidates was not good as the paper 2. The free hand sketching reveals the poor quality of lines, lack of proportionality and resemblance in candidates' answers.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following some strengths:

- Ability of some candidates to use the correct scale and the required dimensions.
- Ability of some candidates to read orthographic and the use of the lowest point to draw the isometric block.
- The features needed in the free hand were well presented for each drawing given.
- Some candidates demonstrated their skills in drawing the foundation, earth filling, hard core, concrete slab, floor finish as well as the walls, doors and roof members.

3. CANDIDATES' WEAKNESSES

The following weaknesses were also reported:

- Poor line work and wrong dimensioning.
- Wrong placement of views, poor sectioning and assembling of components of the mechanical drawing.
- Many candidates were unable to complete the required views for both the building and mechanical drawing within the given time
- Insufficient coverage of the syllabus (which was a clear manifestation of candidates only drawing the given triangular lamina without answering it).

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Candidates should use BS conventions with regards to line work and scale.
- Teacher should put more emphasis on the correct dimensions.
- More practice is required of students on building and mechanical tools, and must demonstrate the awareness of resemblance and proportionality in their freehand sketching.
- Candidates should be able to distinguish the various types of solid figures such as square prism, cone, cylinder etc. and understand the concept of a seam in terms of development(s).
- Teacher should endeavour to cover the syllabus.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

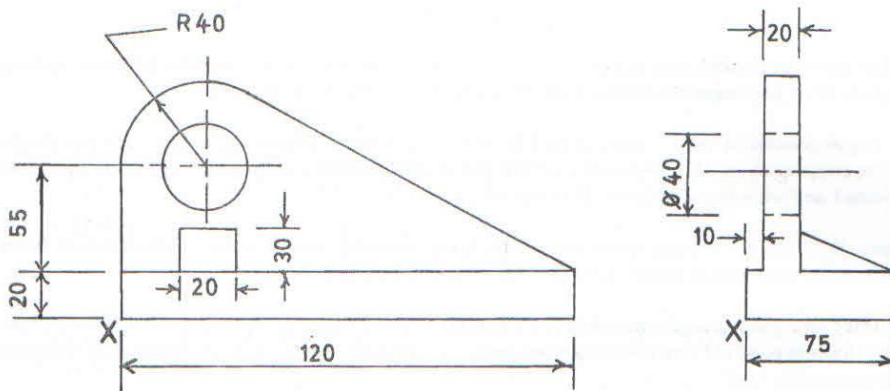
SECTION A

FREEHAND SKETCHING

Answer **two** questions from this section: question **1** and **any** other question.

Question 1

The figure below shows **two** views of a bracket in first angle orthographic projection. Make a freehand isometric drawing of the bracket making **X** the lowest point.



This question examined the knowledge and skills in drawing an isometric block using a specific position (i.e. the right lowest point X) when presented with two views in orthographic drawing. Many candidates used the lowest point wrongly and could not present the required features of the presented drawing. Candidates also demonstrated poor ability in visualizing.

Question 2

Make a neat freehand pictorial sketch of a double-faced sledge hammer.

In this question, the majority of the candidates produced poor quality lines, lack of good proportion and resemblance. The drawing of a claw hammer portrays the wrong prediction of question before the examination.

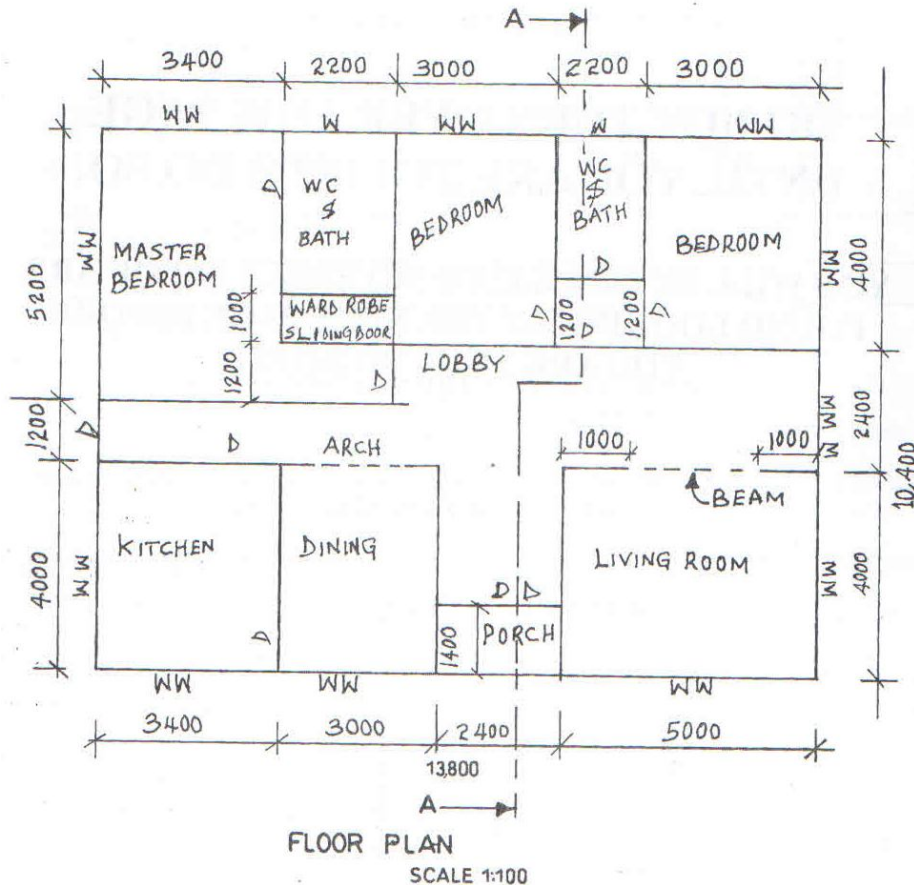
Question 3 *Make a neat freehand pictorial sketch of a centre punch.*

Lack of proportionality and resemblance is also demonstrated by candidates' solution. The majority of them could not present their drawing in pictorial view.

SECTION B
BUILDING DRAWING (OPTIONAL)

Question 4

The sketch below shows the plan of a **three** bedroom bungalow. Study the given specifications and answer the question that follows.



All dimensions are given in millimetres.

FOUNDATION: 675 x concrete strip at a depth 1000 from ground level.

WALLS: All walls 225;
Celling to floor finish 3000.

DOORS: DD 2100 x 1800 x 38 doble swng flush in 100 x 50 timber frame.
D – 2100 x 900 x 38 flush in 100 x 50 timber frame.

WINDOWS: WW – 1200 x 1800 x 38;
W – 600 x 600 x 38;
All louvred in 100 x 50 timber frame.

<i>LINTEL:</i>	<i>225 x 225 reinforced concrete.</i>
<i>ROOF:</i>	<i>25 bituminous felt roof finish on 150 reinforced concrete roof; Eaves projection 600.</i>
<i>BEAM:</i>	<i>225 x 225 reinforced concrete 2425 from finished floor level.</i>
<i>PARAPET:</i>	<i>225 x 225 sandcrete with coping 500 high.</i>

(a) Draw, to a scale of 1:100, the

- (i) Plan;*
- (ii) Front elevation*

The above question examined the knowledge and skills in drawing a floor plan of a building to scale 1:100. The (a) (ii) part tested candidates' knowledge and skills in drawing the required elevation of the given specifications. The majority of the candidates attempted this question, but only a few were able to score high marks in it.

In the (b) part, the sectional view of the building according to the given specifications also examined the candidates' knowledge and skills. Most candidates who attempted this question did not perform well. However, a few were able to present the features as required in the question.

MECHANICAL DRAWING (OPTIONAL)

Question 5

Details of a pulley assembly are shown. The pulley is held in position on the basket by the pin from right to left. With the points assembled, draw full size, the following:

- (a) end view from arrow Y;*
- (b) plan view from arrow X;*
- (c) sectional front elevation on P - P*

This question examined the knowledge, skills, visualization, assembly and sectional view of a pulley assembly/pulley bracket. Only few candidates attempted this question and the performance proved unsatisfactory.

In the (b) part, the questions examined the skills and knowledge in drawing the plan of the pulley assembly/pulley bracket assembled. Few candidates who attempted this question did not score good marks. The candidates' performance was also poor in the (c) part.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
VISUAL ART 2

1. GENERAL COMMENTS

The standard of the paper compared favourably with those of the previous years. The rubrics were also clear and most of the questions set were drawn from various topics within the syllabus. However, the general performance of the candidates was below average.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Some candidates followed the instructions.
- Candidates' writings were legible.
- Most candidates followed the required measurements.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Candidates couldn't differentiate the terms list and explain. (Some candidates ye listed points only where explanations were required).
- Many candidates answered less than the required numbers of questions.
- Misinterpretation of questions.
- Poor command of the English Language.
- Some ceramic works were not fired.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Candidates should be encouraged to take the subject seriously.
- Art teachers should focus more attention on the teaching of colour and correct shading techniques.
- Qualified teachers should teach the subject.
- Good quality art materials should be made available for students and teachers.
- Teachers should endeavor to complete the syllabus.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

PART A

*Answer **one** question **only** from this part.*

Question 1

*Write notes on **five** of the following:*

- (a) Form;*
- (b) Silhouette;*
- (c) Medium;*
- (d) Motif;*
- (e) Torso*
- (f) Pattern*

This question was a test of candidates' knowledge of art terms. Here, candidates were required to write notes on these art terms. Most of the candidates lacked understanding of these terms. Some described Medium as something that is between minimum and maximum size, others misinterpreted Motif.

However, some were able to write good notes on four or five art terms. They got good marks.

Question 2

- (a) What is resist technique in textile design?*
- (b) Describe any **four** of the following resist technique in textile design.*
 - (i) knotting;*
 - (ii) batik;*
 - (iii) stitching;*
 - (iv) marbling;*
 - (v) pleating.*

Candidates were required to explain resist technique and to describe the listed textile design terms. About 80% of those who attempted this question lacked knowledge of these questions. They had no idea about the terms. Some of these candidates described stitching as the art of using sticks to design while others defined marbling as the process of putting marble on the cloth for dyeing.

Few of them who were familiar with these terms, wrote their points correctly.

PART B

*Answer **two** questions **only** from this part.*

Question 3

Write notes on Nike Davies-Okundaye, focusing on :

- (a) training;*
- (b) area of specialization;*
- (c) **five** of her achievements and general contributions to the development of art.*

Nike Davies-Okundaye was not popular question among candidates because notes written on her can be found in few textbooks. Ninety-nine percent 99% of those who chose this question did a lot of guesswork. Some wrote the importance of physical training in the body while others wrote the importance of art as her achievements. Some were able to guess some points correctly.

Question 4

Write notes on **Figure 1** and **Figure 2** under the following:



Figure 1 – Benin Bronze

Figure 2 – Ife Bronze

- (a) *origin;*
- (b) *medium;*
- (c) **three** *similarities;*
- (d) **three** *differences.*

A lot of candidates failed to answer this question because of the quality of printing of the illustrations especially figure 1. It is too dark for candidates to see the features on the figure. That was why they could not write the similarity and differences of these figures correctly. They thereby lost 12 out of 15 marks.

However, some candidates familiar with these illustrations were able to answer the questions and got the maximum points.

Question 5

- (a) *Identify **five** forms of Bamileke wood carvings*
- (b) *Highlight **five** common features of Bamileke wood carvings.*

For part (a) of the question, eighty percent (80%) of the candidates who attempted it did not understand the meaning of the term. It was also interesting to note that they knew the meaning of the features but about 60% of them did not know the particular features of the Bamileke wood carvings.

Some candidates wrote the general characteristics of African sculptures and were able to get some points. Some who were well prepared for the examination wrote many points correctly and got good marks.

Question 6

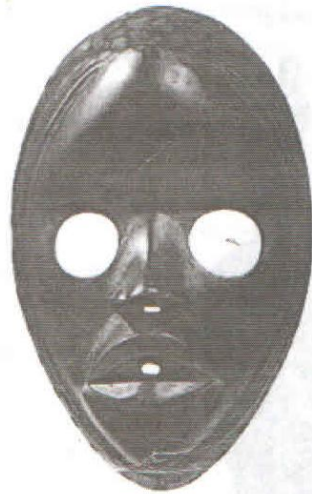


Figure 3

- (a) Identify the mask in **Figure 3**.
- (b) State **two** functions of the mask.
- (c) Mention **four** characteristics of the mask.

About 40% of the candidates could not identify figure 3. Some identified it as Senufo mask (in Liberia and Cote d'Ivoire).

About 20% of those who attempted this question knew the actual functions of the mask.

They were able to mention four characteristics of the mask probably because features were visible.

PART C

Answer **one** question **only** from this part

Question 7

- (a) What is cave art?
- (b) Highlight **two** differences in the representation of human and animal forms in cave art.
- (c) Explain the sources of the following colours in cave paintings:
 - (i) red;
 - (ii) black;
 - (iii) yellow;
 - (iv) brown.

More than 90% of those who attempted this question could not highlight the differences in the representation of human and animal forms in the cave. Many misinterpreted the question by as the colours to mix together in order to get these colours.

Most candidates were able to define cave art. They were also able to explain the sources of these colours in cave paintings.

Question 8

*State **five** differences between ancient Egyptian art and Classical Greek art.*

This question was popular. Unfortunately, few candidates misinterpreted Egyptian art as Pre-historic art. Instead of writing the differences between Egyptian and Classical Greek art, they concentrated on Egyptian art with little or no reference to Classical Greek art. Some candidates were able to write some good answers. They had good knowledge of both topics.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
VISUAL ART 3A DRAWING

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years.

This paper aims at testing candidates' ability and skills at Visual Art in the following areas: drawing from objects (still-life), nature drawing and life drawing. Candidates were expected to accurately represent ideas and objects on paper, and enhance their drawings using the shading techniques to show three dimensionality of the objects they drew and colours as well to show harmony and contrasts, source of light, foreground and background among others.

The performance of the candidates declined when compared to the previous years.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Some candidates were able to produce good works, follow instructions and answer the questions properly.
- The colour application was harmonized.
- The shading was well done.

3. CANDIDATES' WEAKNESSES

The following weaknesses were reported:

- Misinterpretation of the questions.
- Poor drawing ability and composition.
- Poor ability to observe objects.
- Inability to follow the to follow the instructions.
- Candidates inability to effectively create form, solidity and three dimensionality.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Candidates should be scrutinized before allowing them to register for Visual Art.
- Workshops should be held for Art teachers so that they can be updated and upgraded both in terms of knowledge, skills and methodology.
- Schools should provide materials for Art teachers in order to make their work effectively and easy.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

ALTERNATIVE A DRAWING FROM OBJECTS.

Question 1

A basket is placed on a low table against a wall and place a hoe faced down on the table in front of the basket with its handle pointing to the right and also place a broom on the right side of the basket and the cutlass on the left side, allowing both to rest against the basket.

About 75% of the candidates attempted this question. Some of them produced good works and they were well rewarded. Their drawing ability was very good and they follow the instructions on the question paper.

However, the majority of them performed badly. They scored below average mark which is 50 marks. Some of the candidates cannot even draw the basket properly and the baskets they drew were not drawn against the wall while the hoe drawn had the handle pointed to the left instead of right, likewise the broom and the cutlass were also placed at the wrong sides. Their drawing ability and skills were poor. Their drawings were suspended in the air with no baseline at all. Colouring and shading was also poor.

ALTERNATIVE B DRAWING FROM NATURE

Question 2

*Make a detailed drawing of a bunch of plantain with not **less** than **ten** fingers.*

This question was not as popular as question one; about 20% of the candidates attempted it. Few of them did well by producing a bunch of plantain with not less than ten fingers and their drawing ability and observation were good as well. They used colour and shaded properly.

However, most of the candidates who performed badly drew a bunch of bananas which is not even up to ten fingers instead of a bunch of plantain. Their drawing skills and ability to observe were poor as well as the colouring and shading techniques.

ALTERNATIVE C DRAWING FROM LIFE

Question 3

A male model wearing a waist coat on a pair of shorts. He wears a rain boot and sits on a table in a way that his left leg rests on the ground while the right leg is suspended.

Three candidates were able to answer this question properly. Their figures were drawn properly and their shading was also good, therefore they scored good marks.

Only 5% of the candidates attempted this question. The proportion of their figures was not correct and they did not answer the question properly, therefore they scored below average.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
VISUAL ART 3B & C

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. The rubrics and instructions were clear and suitable for the level of the candidates. It is worth noting that the Alternative C paper was more popular than the Alternative B one. The general performance of the candidates was good.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Most candidates followed the instructions.
- Ability to present correct and legible work.
- Candidates had mastery of the topics.
- Some candidates were able to present perfect lettering.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Inability to follow the instructions for some candidates.
- Inability to differentiate key words like –explain, list. (Some candidates listed points where explanations were required)
- Misinterpretation of questions.
- Poor command of the English Language.
- Patterns colouring and tone were mismatched.
- Some ceramic works were not fired.
- Inability to apply to apply basic skills in painting and design.
- Inappropriate guidance was obvious in the work of some candidates.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Teachers should endeavour to cover the syllabus.
- Candidates should take Visual Art lessons seriously.
- Workshops should be held for Art teachers.
- Schools should provide materials for Art teachers in order to make their work effectively and easy.
- Candidates should be encouraged to start doing their works on time, so that they will be able to produce good works.
- Teachers should read and interpret the questions properly for candidates before
- Remedial lessons should be organized for weak candidates.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

ALTERNATIVE B

SECTION A GRAPHICS

Question 1

Careless disposal of waste is a threat to healthy living, which is becoming a common practice in your locality. In view of this, your local government administrators are planning to embark on awareness campaign on healthy waste disposal practices. Design a pictorial poster for this campaign with the slogan: WASTE TO HEALTH.

*Colours: **not more than three***

Size: 40 cm by 30 cm.

This question was popular. Few candidates were able to present few good designs while the majority of them did not capture the essence of a poster as an advertisement. The lettering construction and illustrations were appropriate but the layout of the designs was only fair and the colour schemes were not bold eye catching.

Question 2

Cool Life is a new brand of table water by Cool Man Ltd.

Design a pictorial poster to sell the brand using Chilly and Refreshing as the Unique Selling Proposition (USP)

*Colours: **Not more than three**;*

Size: 40cm by 30cm.

The colour schemes were generally unimpressive and the construction of the letters posed a problem for many candidates. Some of them did not utilize the paper space well. Too much space was left out.

Some designs were quite good . The colours were suitable.

SECTION B TEXTILE DESIGN

Question 3

Adopting floral motifs, make a design for a fabric to be used on Childrens' day. Use mirror repeat pattern.

*Colours : **Not more than three***

Size: 25cm by 15cm.

Some of the candidates used irrelevant motifs. Most of them adhere to the required size and colours. About 60% of them did not use mirror repeat pattern. A few of them used good colour schemes with mirror repeat patterns. The works were very good. They managed the paper space well.

Question 4

*Adopting an abstract motif, make a design for a fabric to be used as curtain in a museum.
Use Ogee repeat pattern.*

*Colours: **Not more than three**;*

Size: 25cm by 15cm.

This question was not popular. Most of the candidates did not understand Ogee repeat patterns. Only few submissions were made. Some of the motifs were abstract and candidates used good colour schemes.

SECTION C PICTURE MAKING

Question 5

Make an imaginative painting of any of the following topics.

Our culture, our heritage.

This question was not popular. Most of the compositions depicted our culture and a good number of the paintings were flat. Perspective was shown in some of the works. Two candidates showed some skills in figure drawing and painting.

Question 6

Picnic at the beach.

Of the 12 submissions, seven actually depicted a scene of picnic at the beach. The colours were not strong. There were few figures in these compositions. Only two candidates were able to submit good compositions with good perspective, background and good paintings of figures.

ALTERNATIVE C

SECTION A CERAMICS

Question 1

Using any idea from a natural object, produce a flower vase to be used at the palace.

Decorate appropriately with traditional symbols.

Height: 30cm

This was the most popular question. About 45% of the candidates attempted it. Nearly 95% of these flower vases were ordinary. The ideas were not from natural objects. Few of them had traditional symbols as decorations and they were well fired beautifully decorated.

SECTION B SCULPTURE

Question 2

*Make a free standing sculpture of the Royal Drummer.
(clay work should be fired)*

Height: 30cm.

Instead of free standing sculptures, some candidates submitted relief sculptures of Royal Drummer. Proportions of these figures were inaccurate. They were not properly finished.

SECTION C PRODUCT DESIGN / MODELLING

Question 3

Produce a 3-dimensinal package for a new diary product branded COW NUNU by Tino Industries Limited.

Since there was no specific size recommended, candidates submitted different sizes of work. Some were too big for diary products. A centre used computers to produce works. Very few of these works were suitable for diary products. They were not attractive.

SECTION D CRAFTS

Question 4

About 35% of candidates answered this question. Almost 80% of these works were very attractive. Candidates that produced them spent a lot of time and money. Figures in these works were proportional and well composed, some with back grounds. A few candidates framed their works with glasses. Most of the works got above average marks.

Only few of the works were not attractive. The colours were dull and some of these works were incomplete. The beads were falling off from some of these works because the candidates did not apply sufficient glue when producing them.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
APPLIED ELECTRICITY 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. A total of Eighty nine (89) candidates representing 100% sat for this examination this year. The general performance of the candidates was poor.

2. CANDIDATES' STRENGTHS

The Chief Examiner didn't say much about candidates' strengths. He only reported that most of the candidates were able to answer all the questions. They did well in questions, 2, 3 and 5.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Inadequate coverage of the syllabus.
- Inability to state the functions of the following parts of a d.c. generator:
 - (a) yoke;
 - (b) poles;
 - (c) commutator;
 - (d) armature.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions to improve on the performance:

- Teachers should endeavour to cover the syllabus.
- Proper teaching aids should be provided e.g. text books, practical training materials.
- Students and teachers should have access to the following books:
 -
 - (a) *Electrical Circuit Theory and Technology* (J.O. Bird)
 - (b) *Basic Electrical Installation Work* (Trevor Linsley)
 - (c) *Electrical Circuits* (Schaum's Outlines)
 - (d) *Electrical Circuit Technology* (Hughes)
 - (e) *Electrical Craft Principle* (J. Withfield)

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A

Answer **three** questions **only** from this section.

The table below shows the percentage of candidates who attempted each question.

Questions Number	Topic	Responded %	Did not respond %
1	Electrical power, Energy and Quantity of electrical	96	4
2	R-C series and power triangle	58	42
3	Sources of supply , solar and electricity and accumulator	76	24
4	D.C Generator, yoke, poles, commutator, and armature,	42	58
5	Hydro and gas power electric generating stations and protective devices	42	58
6	Repairs of electric appliances irons and safety precautions,	64	36
7	Electric faults , open , short circuits and electric blender	58	42

Question 1

(a) Define the following terms:

- (i) electric power;
- (ii) electric energy.

(b) **Three** resistors are connected in parallel across a 12 V supply. If the current flowing through each resistor for 45 s is 5 mA, 2 mA respectively, calculate the:

- (i) quantity (Q) of electricity in the circuit;
- (ii) electrical power (P) consumed;
- (iii) electrical energy consumed.

Eighty five(85) candidates representing 96% of the total number of candidates attempted the question. Only few of them (29%) were able to score good average marks.

Question 2

(a) Draw and label the power triangle.

(b) A series RC circuit has a resistance of $3\ \Omega$ and a capacitive reactance of $4\ \Omega$, calculate the impedance of the circuit.

Fifty two (52) candidates representing 58% of the total number of candidates attempted this question. Thirty five(35) candidates representing 67% of them got the pass mark.

Question 3

- (a) *State two resources by which a battery can be re-charged.*
- (b) *State the principle of operation of the following:*
 - (i) *solar cell;*
 - (ii) *accumulator.*

Sixty eight(68) candidates representing 76% of the total number of candidates attempted this question. Thirty nine (39) of them representing 57% were able to score the average pass marks

Question 4

State the function of the following in a d.c. generator:

- (a) *yoke;*
- (b) *poles;*
- (c) *commutator;*
- (d) *armature.*

Thirty seven (37) candidates representing 42% of the total number of candidates attempted the question. All of them performed badly.

SECTION B

*Answer **two** questions **only** from this section.*

Question 5

- (a) *State **two** possible causes of current flow in the metal part of an appliance connected to a voltage source.*
- (b) *List **four** electrical devices common to hydro- and gas electric power generating stations.*
- (c) *List **two** types of protective devices that can be found in an insulation.*

Thirty seven (37) candidates representing 42% of the total number of candidates attempted this question. Twenty two (22) candidates among them representing 59% were able to score the average pass marks.

Question 6

- (a) State **three** safety precautions that are observed during the repair of electrical appliances.
- (b) An electric iron plugged into a live socket outlet did not heat up.
- (i) State **three** likely causes of the fault.
- (ii) State **two** types of test that can be used to investigate the fault.
- (iii) List **two** instruments that can be used for the repair.

Fifty seven (57) candidates representing 64% of the total number of candidates attempted this question,. Twenty five(25) of them representing 44% were able to score the pass mark.

Question 7

- (a) Explain the following electrical faults.
- (i) open circuit;
- (ii) short circuit.
- (b) State **five** measures that can keep an electric in good working condition.

Fifty two (52) candidates represent 58% of the total number attempted this question. Twenty (20) candidates representing 38% of those attempting the question scored the pass mark.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
APPLIED ELECTRICITY 3

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. The Paper 3 was a well-structured practical test that gave candidates good chance to prove their ability and practical skills. The overall performance was good.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Ability to select the correct procedure for the job in hand.
- Candidates followed the instructions and attempted all the questions.
- Candidates did well in all the questions.

3. CANDIDATES' WEAKNESSES

The Chief Examiner didn't say much about candidates' strengths apart from stating that the four candidates who performed badly were not able to provide the proper procedure for the job in hand.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions to enhance candidates' performance:

- Schools should provide adequate equipment, tools and good electrical installation books.
- Qualified teacher should be employed to teach the subject.
- Candidates should be exposed to practical works.

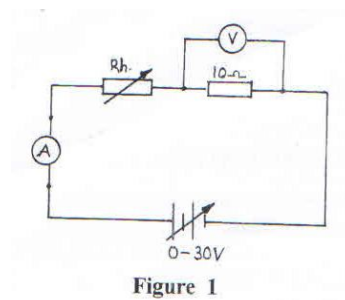
5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

The table below shows the percentage of candidates who attempted each question.

Quantity	Topic	Responded %	Do not responded %
1	Variable d.c power supply unit (0-30v), voltmeter, (0-15V), Ammeter (0-10A), rheostat (Rh), resistors two(10Ω , $\frac{1}{2}w$), connected in circuit , to verify voltage and graph	100%	0%
2	Variac transformer, voltmeter, Ammeter ,resistors connected in circuit , to verify current and resistance at constant voltage and graph	100%	0%

Question 1

AIM: To demonstrate Ohm's law.



- (a) Connect the circuit as shown in **Figure 1**.
- (b) Ask the supervisor to check the circuit connection.
- (c) Copy **Table 1** into your answer booklet.

Table 1

Current (A)	Potential difference (V)
2.00	
1.80	
1.60	
1.20	
1.00	

- (d) Adjust the power supply unit to 20V and maintain this voltage throughout the experiment.
- (e) Vary the rheostat to indicate a current of 2 A on the ammeter.
- (f) Read and record the corresponding value of voltage (V).
- (g) Repeat steps (e) and (f) for the other current values in Table 1.
- (h) Plot a graph of potential difference (V) on the vertical axis against current (A) on the horizontal axis.
- (i) Determine the slope of the graph.
- (j) Compare the value of the slope in (f) with the value of the fixed resistor.

All the candidates attempted this question and eighty four (84) candidates representing 94% of the total number scored the pass marks. Only five (5) candidates performed badly.

Question 2

AIM: To demonstrate the relationship between current, voltage and power in a dc circuit.

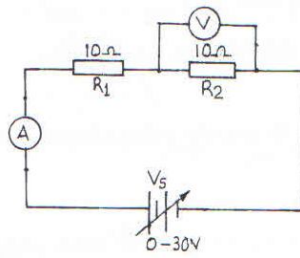


Figure 2

- Connect the circuit as shown in **Figure 2**.
- Ask the supervisor to check the circuit connection.
- Copy **Table 2** into your answer booklet.

Table 2

Voltage (V_s)	Voltage drop across V_R	Current (A)	Power (W) IV_R

- Adjust the power supply unit to 12V.
- Read and record the current (A) and voltage drop across the resistor R_2
- Repeat steps (d) and (e) for the other values of voltage in **Table 2**.
- Complete **Table 2**.
- Compare the voltage drop across R_2 and the power calculated

All the candidates attempted this question and eighty three (83) candidates representing 93% of the total number did well. Only six (6) candidates performed badly.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
AUTO MECHANICS 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. This year's marks have indicated a small improvement on candidates' performance when compared to the 2016 results. 23% of the candidates were able to get the average mark. This has indicated 11% increase in the number of candidates who passed this paper compared to the previous results.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- Ability to list the two forms of cooling system employed in motor vehicle engines.
- Ability to name the two types of thermostat used in a cooling system.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported that candidates lacked of knowledge in the three-speed sliding mesh gearbox and their inability to calculate gear ratio.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Teachers should endeavour to cover the syllabus.
- Candidates should be adequately prepared for the examination.
- Candidates should be exposed to more practical lessons to enable them identify vehicle components and understand how they operate.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

*Answer **four** questions **only***

Question 1

*The sketch in **fig.1** shows the layout of the fuel supply system of a compression ignition engine.*

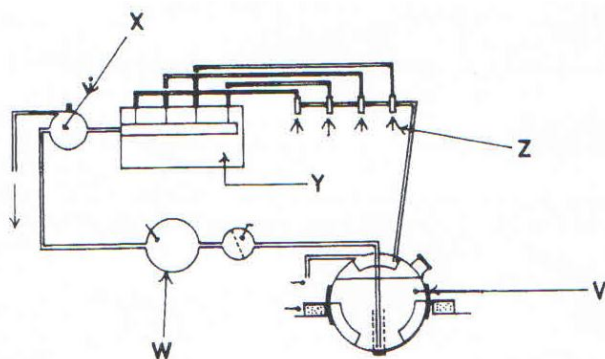


Fig. 1

- (a) Identify the parts labelled V, W, X, Y and Z.
- (b) State the purpose of the part labelled X:
- (c) State two merits and two demerits of a compression ignition engine.

69% of the candidates attempted this question and 31% abstained. This question only required identification of components of the compression ignition engine fuel system. It also asked for the advantages and disadvantages. Candidates got only 20% of the question correct and 74% of the questions were wrongly answered. This indicates that this topic may have not been thoroughly treated in the classroom.

Question 2

- (a) List **three** types of oil pump.
- (b) Sketch **one** type of oil pump
- (c) State **two** requirements of an engine oil.
- (d) Describe how to change an engine oil.

96% of the candidates attempted this question and only 4% abstained. This question was well-constructed and very important for candidates who intend to pursue mechanics as a career. The marks registered for this question are as follows: 26% as correct answers, and 74% as wrong answers. Here the problem was the candidates' inability to present a good sketch and to describe how to change an engine oil.

Question 3

- (a) State two-safety precaution to be observed on each of the following.
 - (i) Checking the specific gravity of an electrolyte.
 - (ii) Jacking a vehicle.
 - (iii) Working on an overheated water-cooled engine.
- (b) (i) What equipment is used to put out fire in an engine?
- (ii) Name the constituent of air that supports combustion.

94% of the candidates attempted this question and 6% abstained. This question registered the second highest percentages of correct answers, which is 56% and 44% as wrong answers. This indicated that this area was well treated in the classroom.

Question 4

The sketch in **Fig. 2** represents a three-speed sliding mesh gearbox in a neutral position.

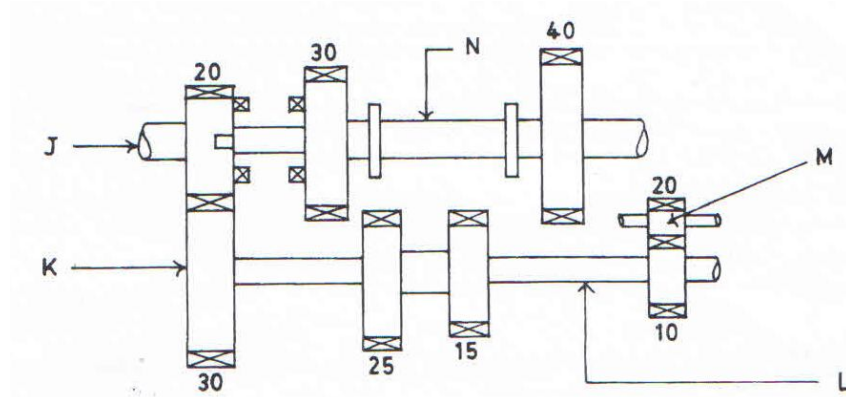


Fig. 2

- (a) Identify the parts labelled **J, K, L, M** and **N**.
- (b) Calculate the first gear ratio.
- (c) Calculate the reverse gear ratio.
- (d) List **two** types of gear teeth used in constant mesh gearbox.

Only 40% of the candidates attempted this question and 60% abstained. A well-constructed question but candidates failed to make effort in securing good marks in all the questions. Candidates managed to have only 20% of the total questions correct and the remaining 60% of the questions were answered wrongly. Few candidates attempted this question and performed badly. This indicates that this topic was not well covered.

Question 5

- (a) List the **two** forms of cooling system employed in motor vehicle engines.
- (b) With the aid of sketch, describe how the thermo siphon system operates and label **four** of its parts.
- (c) Name the **two** types of thermostat used in a cooling system.

96% of the candidates attempted this question and only 4% abstained indicating that this topic was well covered at classroom level. 62% of the questions were answered correctly and 38% wrongly. Here the problem for candidates was question 5 (b) which they could not state how circulation of the water starts in the thermos-syphon cooling system.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
AUTO MECHANICS 3

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. The paper was well-structured and it provided good chance for candidates to prove their ability and skills. The overall performance of candidates was good.

It is worth mentioning to engage more examiners where the number of candidates is large, e.g. St.Peters. This would reduce the waiting time of the candidates. Another possibility is to divide candidates into two groups. Group one will begin from the starting time of the assessment to 12:00 noon and group two starts from 12:00 onwards.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported that candidates had demonstrated their ability in selecting the correct tools for the job in hand.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported that some candidates were unable to provide the proper safety gear for the precaution needed in the workshop.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions to improve on candidates' performance:

- Practical assessment should always be conducted with the proper safety gears.
- Enough machines should be provided for candidates during the practical assessment.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

From the engine provided:

- (a) *Remove the cylinder head.*
- (b) *Examine the combustion chamber.*
- (c) *Decarbonize the combustion chamber.*
- (d) *Examine the cylinder head gasket.*
- (e) *Answer two relevant questions from the examiner.*
- (f) *Refit the cylinder head to the engine.*

This was a well-constructed question which required the candidates' ability to remove and replace the cylinder head. Candidates will also have to demonstrate the correct sequence in tightening the cylinder head, decarbonize the combustion chambers and select a good cylinder head gasket. Here, few candidates had difficulties in identifying the engine components.

Question 2

From the vehicle provided:

- (a) Remove one rear wheel specified by the examiner.*
- (b) Remove the brake drum and examine its inner parts*
- (c) Remove the brake shoes.*
- (d) Check the condition of the brake springs.*
- (e) Adjust the brake.*
- (f) Answer two relevant questions from examiner.*
- (g) Refit the brake drum.*
- (h) Refit the road wheel.*

The question was well structured. It required the candidates' ability to remove the rear wheel and perform any given task in a drum braking system. It also required candidates' ability to adjust the drum braking system. The candidates' performances were good since 70% of them were able to perform the task correctly.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
WOODWORK 2

1. GENERAL COMMENTS

The standard of the paper was appropriate, within the scope of the syllabuses and compared favourably to those of the previous years. The general performance of the candidates in the Essay, Design and Drawing was below average. The performance in the practical was by far better than the performance in the Essay. Free hand and sketches were not up to standard and as a result of that, candidates' marks were poor.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- About 75% of the candidates were able to finish their work within the time frame.
- Some of the candidates were able to answer all the three questions.

3. CANDIDATES' WEAKNESSES

The Chief Examiner reported the following weaknesses:

- Candidates failed to attempt all parts of a given question.
- Poorly attempted sketches.
- Poorly labelled sketches.
- Candidates had no knowledge of machines.

4. SUGGESTED REMEDIES

The Chief Examiner proposed the following suggestions:

- Rubrics / instructions should be read and understood before attempting any question.
- Two drawing papers should be used for Design and Drawing.
- Candidates should endeavor to rule border lines on all sides of the papers.
- More emphasis should be put on free hand sketches.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

SECTION A PART 1

Fig. 1 shows the sketch of a trinket box which is to be constructed. The top of the box is to be covered with plastic laminate. *Use it to answer question 1 (a).*

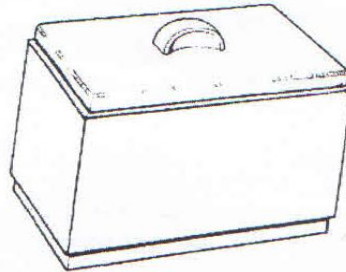


Fig. 1

1.
 - (a) (i) Name a **suitable** decorative joint for joining the sides of the box.
 - (ii) Make a pictorial sketch of the joint named in question 1(a)(i).
 - (b) (i) Name two tests carried out when hand planning a stock to finish size
 - (ii) List three tools used when preparing a stock to finished size.

(a) (i) About 80% of the candidates could not answer this part of the question. The sketches were poorly done. Only few were able to name joints. The expected joints are as follows:

- Through dovetail joint
- secret mitred but etc.

(a) (ii) This question was not understood by the candidates. Marks were low and sketches were bad. The question was asking for a decorative joint.

(b) (I) About 70% of the candidates avoided this part of the question.

(b) (ii) List of tools required for preparing a stock to a finished size.

Some of the candidates explained a planning operation. Candidates are supposed to list any three tools. The candidates failed to mention any of the planes e.g. jack plane, try plane, etc.

Question 3

(a) State three general safety precautions that should be taken during the use of a woodworking machines.

This question was unpopular. It seems that most schools are not equipped with woodwork machines. Candidates were expected to list three safety precautions e.g. makes adequate use of guards and safety devices, no running or fooling around, etc.

(b) List **two** operations required to keep the cutting edge of a tool keen.

Only 5% of the candidates attempted this part of the question and scored 1 out of 2 marks. The required operations were grinding, sharpening/honing, polishing.

(c) State **one** reason why a lubricant is used on an oilstone when sharpening a tool

The word lubricant has been misunderstood by some of the candidates and therefore gave a wrong answer. Lubricant is used to reduce friction and reduced the clogging of the stone etc.

4. (a) (i) Sketch the cross-section of a log.
(ii) Label the following parts of the log sketched in question 4(a)(i):
(1) sapwood;
(2) medullary rays

This was the most popular part of the questions. Most of the candidates attempted this part but scored low marks.

(c) Name **two** types of metals used in Woodwork.

This part of the question was popular. About 65% of the candidates were able to name the metals e.g. cast iron, steel, brass etc.

(c) List **two** methods of producing veneer.

About 85% of the candidates were able to name two methods of producing veneer.

SECTION B DESIGN AND DRAWING FOR ALL CANDIDATES

Answer **all** questions.

A bookcase is to be designed to the following specifications:

Height	-	350mm;
Width	-	360mm;
Depth	-	210mm.

The bookcase is made from 20 mm solid wood.

It has one shelf and one panel glazed door.

1. Make two preliminary freehand pictorial sketches each for a different design of the bookcase
2. Select one of the sketches in question 1 and indicate the selected sketch with a tick (✓).
To a scale of 1:2, draw in the First Angle Orthographic projection the following:
 - (a) front elevation;
 - (b) plan with top removed.

Candidates are supplied with **two** drawing papers 420 x 594mm. A book case is to be designed. It is to be made from 30mm solid timber and it has one shelf and one panel glazed door. Candidates are to make **two** preliminary free hand pictorial sketches. About 30% of the candidates were supplied with one drawing paper instead of two drawing papers.

Question 1

Candidates are required to make **two** preliminary pictorial sketches of different design.

About 40% of the candidates made only **one** therefore losing half of the allocated mark. The book case is supposed to have a shelf and one panel glazed door. The candidates failed to scale the drawing. Candidates were to draw in the first Orthographic projection of the following:

- (a) front elevation
- (b) plan with top removed.

The front elevation and plan were poorly drawn and the top was not removed. Marks were also awarded for good draughtsmanship. The general performance in this section was below average.

WASSCE FOR SCHOOL CANDIDATES, 2017
CHIEF EXAMINER'S REPORT
WOODWORK 3

1. GENERAL COMMENTS

The Standard of the Woodwork paper 3 (practical) was within the scope of the syllabus. The general performance of the candidates was very impressive. About 85% of the candidate scored high marks. The wood supplied was of the proper texture and hardness. Candidates demonstrated their skills in the practical.

2. CANDIDATES' STRENGTHS

The Chief Examiner reported the following strengths:

- About 90% of the candidates were able to assemble their work on time.
- The timber used for the practical was adequate and well-seasoned.
- Tools were adequate in most of the centres.

3. CANDIDATES' WEAKNESSES

- Tools were not sufficient in some of the centres.
- Some of the candidates found it difficult to use some of the tools.

4. SUGGESTED REMEDIES

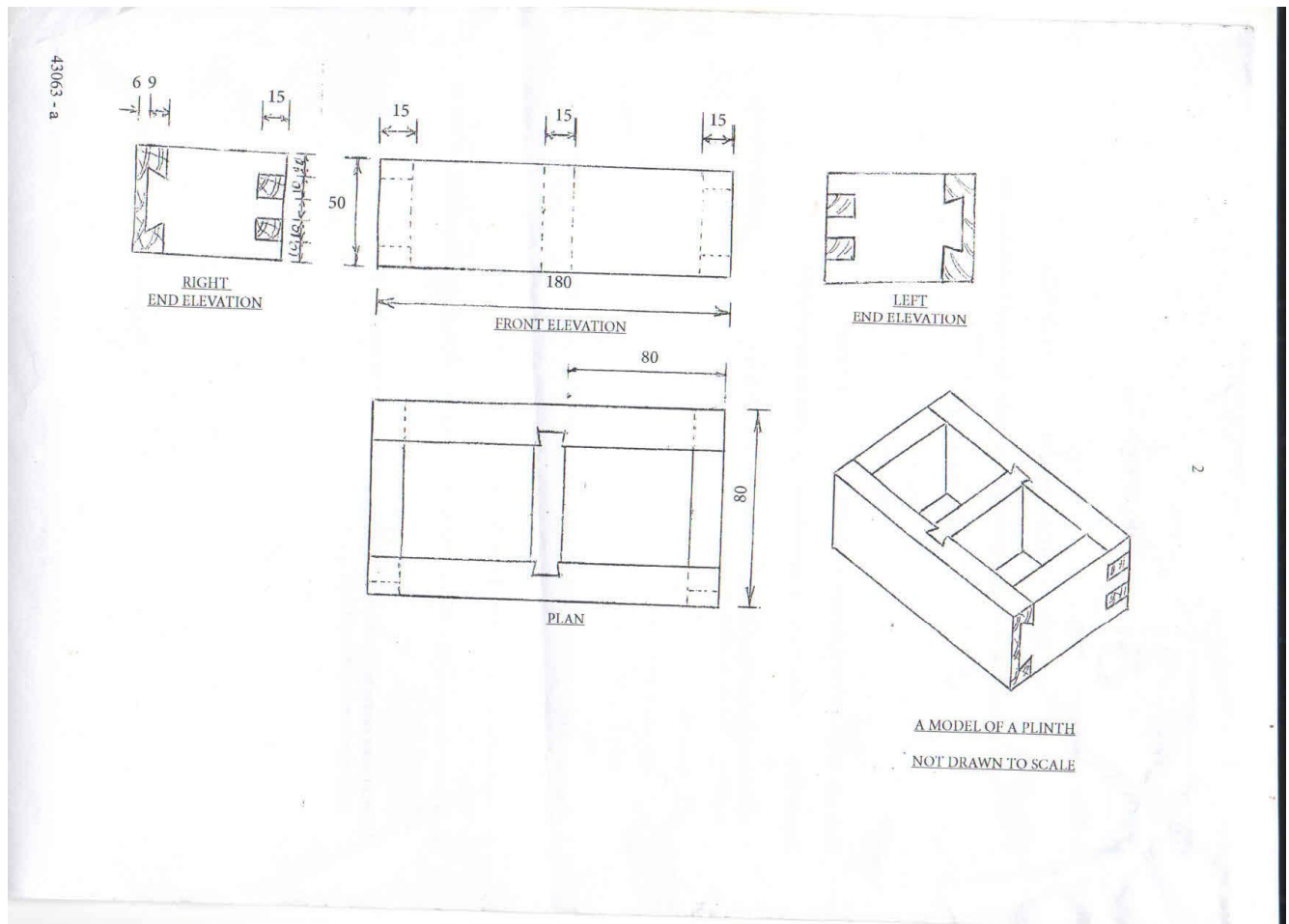
The Chief Examiner proposed the following suggestions:

- Teachers and their students should visit some workshops to enable candidates familiarise themselves with the various practical materials.
- Candidates should be exposed to more practical works.

5. DETAILED COMMENTS ON INDIVIDUAL QUESTIONS

Question1. Make the test piece below, using the timber which has been planed to the following sizes (all dimensions are in millimetres):

two pieces 190 x 50 x 15;
two pieces 90 x 50 x 15;
one piece 70 x 50 x 15.



A. LAPPED DOVETAIL JOINTS

About 60% of the candidates mark-out and constructed the lapped dovetail joint scoring between 20-30 marks

B. FINGER JOINTS.

The marking-out, pins and sockets were will done by most of the candidates

C. THROUGH DOVETAIL HOUSING JOINTS

About 50% of the candidates were able to mark out pins, sockets accordingly.

D. FINISHING

About 90% of the candidates assemble their project within the time.