PRINCIPAL EXAMINER'S REPORT

BOTSWANA
EXAMINATIONS
COUNCIL

BGCSE AGRICULTURE

2023

Advancing learning, certifying your future

Paper 1: Multiple Choice (0599/01)

Section 1: General Comments

This is a 40-mark multiple choice paper written in 45 minutes. The candidates who cannot easily express themselves through writing usually benefit greatly from the objective scoring of this component. The 2023 paper was accessible across a wide ability range with a minimum score of 4 and a highest of 40 and average score of 22 marks. The reliability index of the paper was 0.78 which is slightly better than of the previous year. The standard deviation of 15% on the other hand indicates that the paper fairly spreads the candidates across the available marks thus discriminating candidate performance well. Most of the 2023 Paper 1 properties compares closely with those of the 2022 paper. When observing the distractors selected by most candidates, some common misconceptions are noticed. Therefore, deliberate effort to address these misconceptions must be made during the teaching and learning process.

Section 2: Comments on Individual Items

The table presents each item and its brief analysis. Make use of the analysis to improve the quality of the items you develop in case you re use the items.

NB: N represents the number of candidates selecting the option.

Key represents the option consider as the correct response for the item.

1 This is a simple comprehension item that requires the candidate to recognize an environment ideal for development of fungal infections in plants.

Option	N	Key	Comment
A	5541	D	Most of the candidates did not get the answer correct. Distractors **A** was more appealing to the candidates who got this item incorrect. It should be of interest to find out why many candidates think fungal infections could increase at a low temperature.
B	1407		
C	517		
D	3961		

2 The item required the candidate to demonstrate understanding the impact of hunting and gathering on the environment.

Option	N	Key	Comment
A	2142	C	Considering the number of candidates settling for the Key, it is concluded that most candidates have a good understanding of the impact of hunting and gathering on the environment. Distractor **B** was weak as it was shunned by most candidates
B	762		
C	6993		
D	1529		

3 This is a typical comprehension item that requires the candidate to demonstrate understanding of the land tenure system of Botswana.

Option	N	Key	Comment
A	739	B	The item was well done by most candidates. Distractor **A** was the weakest link and was rejected by most candidates who did not get this item correct
B	8219		
C	1164		
D	1304		

4 This was a simple comprehension item that required the candidates to demonstrate understanding of the process taking place in the water cycle.

Option	N	Key	Comment
A	413	C	Well done by most candidates, distractors A and B appeared to be less appealing to candidates who did not know the answer.
B	473		
C	8928		
D	1612		

5 The candidates were presented with a section through a flower and were required to identify the part that attracted the bee to the flower.

Option	N	Key	Comment
A	3002	B	The item was well done. It appears distractor D was not appealing to the candidates who did not get this item correct. The other two distractors were in fair competition.
B	6706		
C	1088		
D	630		

6 This is a simple comprehension item that requires a candidate to demonstrate understanding of the benefits of weeds to crops.

Option	N	Key	Comment
A	2079	C	Most candidates were able to demonstrate understanding of weeds to crops. Distractors B and D seems to have been less appealing to the candidates who got this item incorrectly. Distractor A was more appealing to candidates who got this item incorrectly.
B	846		
C	7721		
D	780		

7 The candidates were provided with a situational analysis and were required to recommend appropriate measures that could be put in place to address the situation.

Option	N	Key	Comment
A	7887	A	Most of the candidates got the key correctly, which indicates a good understanding of the concept on fungal disease control. Distractors B was very weak and did not have a significant appeal to candidates who did not know the correct answer.
B	514		
C	1338		
D	1687		

8 This is an application item that requires the candidates to demonstrate their understanding of how to compute the mass of seeds required for given area when seed rate is known.

Option	N	Key	Comment
A	509	D	Most candidates got this item correct, the few that got the item incorrect were fairly distributed among the three distractors
B	635		
C	879		
D	9403		

9 Based on the known cost of seeds per hectare, the candidates were require to compute the cost of seeds for the 5 hectare pasture.

Option	N	Key	Comment
A	575	C	Most candidates were able to compute the cost of seeds for the whole pasture. However, distractors A and B were not appealing to the candidates and as result was shunned by most candidates. Only Distractor D had a strong appeal
B	497		
C	7548		
D	2806		

10 This is a high-level comprehension item that required the candidates to demonstrate understanding of the direction of mineral ions as they enter the plant root by active transport.

Option	N	Key	Comment
A	1183	D	Most of the candidates were able to correctly identify the direction of the arrows for active transportation of mineral ions. It seems all the distractors were equally attractive to candidates who got this item incorrect. Therefore, it was a good assessment item.
B	2812		
C	2379		
D	5052		

11 This is high comprehension item that required to determine a combination of pesticides that will be appropriate for controlling piercing and sucking pests.

Option	N	Key	Comment
A	3025	B	Most of the candidates got this item correct. A considerable number of candidates opted for distractor A. This indicates that a significant number of candidates think that contact and stomach pesticide will be appropriate for controlling piercing and sucking pests
B	6082		
C	1253		
D	1066		

12 This is an application question where the candidates were provided with drawing of a plant coiling up a stick. The candidates are required to recognize an external growth stimulus that causes the coiling of the plant around the stick.

Option	N	Key	Comment
A	2461	C	A significant number of candidates managed to answer this item correctly. Distractors A and B appeared to be appealing to candidates who did not know the answer. However, distractor D had very little appeal to candidates who did not know the answer.
B	1379		
C	7100		
D	486		

13 This a simple knowledge item that required the candidate to name the part of the plant stem that transports sugar from the leaves to storage organs.

Option	N	Key	Comment
A	1466	B	The item was fairly done. Distractors A and D were effective and attracted a significant number of candidates who did not know the correct answer. However, Distractor C seem to have been a very weak distractors and attracted fewer candidates who got this item incorrect.
B	6843		
C	931		
D	2186		

14 This is a simple knowledge item that required the candidates to recognize what landscaping is based on the given definition.

Option	N	Key	Comment
A	10337	A	Most candidates settle for the correct answer which is A. Only a few candidates got the item incorrect and were attracted to distractor D than B and C
B	126		
C	243		
D	720		

15 The candidates were presented with a tool and were required to prescribe the appropriate use of the implement in lawn management. This a simple comprehension question that requires knowledge of tools and their use.

Option	N	Key	Comment
A	481	C	Most of the candidates correctly answered this item. A significant number of candidates confused the tool with the one used for spiking. Distractors A and B were weak and so appealing to the candidates who got this item incorrect.
B	944		
C	5515		
D	4485		

16 This is a simple comprehension item requiring the candidate to demonstrate the function of the corpus luteum in the reproductive system of a ruminant.

Option	N	Key	Comment
A	2989	D	This item was poorly done, most of the candidates thought the corpus luteum induces heat and therefore settled for distractor B. The other distractors were also appealing to the learners who did not know the answer.
B	5064		
C	1074		
D	2298		

17 This item is a simple computation item requiring the candidate to calculate the rate of fertilizer application when given the number of 50kg bags used in a 3-hectare field.

Option	N	Key	Comment
A	1276	C	The candidates performed so well on this item. All the distractors appear to have equal appeal to the candidates who did not know the correct answer.
B	2164		
C	5941		
D	2044		

18 A typical application item requiring the candidate to recognize the correct way of placing an ornamental plant into a planting hole.

Option	N	Key	Comment
A	311	C	Most candidates correctly answered this item. Most of the candidates who did not know the answer settled for distractor B. Distractors A and D were very week and have very little appeal to candidates who did not know the correct response.
B	1407		
C	9384		
D	323		

19 This item requires the candidate to express knowledge of a wide range of terminology used in Agriculture. The item required the candidates to demonstrate understanding of the term stockmanship.

Option	N	Key	Comment
A	845	D	Most of the candidates got this item correct. Those who did not know the answer were fairly spread across the distractors. Therefore, this was a fairly balance item. None of the distractors are in competition with the key.
B	1133		
C	549		
D	8898		

20 The item provided a drawing of the reproductive system of a hen, and it required the candidates to identify the part called the magnum. This is a simple application of knowledge item.

Option	N	Key	Comment
A	4319	A	Most of the candidates answered the item incorrectly. Distractor B contended strongly with the correct response. It will be important to explore the reasons why? Perhaps there is a common misconception surrounding the two parts.
B	3578		
C	2568		
D	960		

21 Based on the drawing of the reproductive system of a hen provided, the candidates were expected to express their understanding of the part labelled **M.**

Option	N	Key	Comment
A	1467	C	The item was fairly attempted, most of the candidate got the item correctly. The rest who didn't know the correct response were widespread across the distractors, which indicates that the item was balanced.
B	1378		
C	6853		
D	1727		

22 The candidates were given a description of a scenario and were expected to deduce from the scenario the concept of range management being practiced by the farmer.

Option	N	Key	Comment
A	9323	A	The item was answered correctly by most of the candidates. The few candidates who answered this item incorrectly were shared between distractor B and D. Distractor C was the weakest link and had a very low appeal to candidates who did not know the correct answer.
B	1034		
C	173		
D	895		

23 This is a simple comprehension item that requires the candidate to demonstrate understanding of silage making by expressing the reasons why silage ought to be kept under airtight conditions.

Option	N	Key	Comment
A	3395	C	Most of the candidates did not get the item correct. Those who did not get the item correctly were evenly spread across the distractors, however distractors A and B were strongly appealing to the candidates than the correct response.
B	3932		
C	2398		
D	1699		

24 A business situational analysis is presented to the candidate. The candidate is expected to deduce from the scenario presented the form of business being operated.

Option	N	Key	Comment
A	1300	D	A significant proportion of candidates got the item incorrectly. It will be of interest to find out why a good number of candidates thought B was a plausible response. Otherwise, distractors A and C pulled an equal number of candidates that answered the item incorrectly.
B	5337		
C	1048		
D	3739		

25 This is a typical application question based on concepts of agriculture economics requiring the candidates to demonstrate understanding of the relationships between the demand of two products when the price changes.

Option	N	Key	Comment
A	3478	C	Most of the candidates managed to demonstrate the relationship between price and demand for two substitute products. Distract B was not a plausible distract, it was rejected by most candidates who got this item incorrect.
B	184		
C	6590		
D	1172		

26 This is a typical comprehension item requiring the candidates to reflect on the benefit of technology on supply of produce.

Option	N	Key	Comment
A	750	D	Most candidates were certain that use of improved technology will lead to increased supply of produced goods. It is worth exploring why a significant number of candidates think improved technology will lead to increased demand.
B	565		
C	3484		
D	6625		

27 This is a simple comprehension item that requires the candidate to demonstrate understanding of production costs.

Option	N	Key	Comment
A	5616	A	A smaller proportion of the candidates got this item correctly compared to those who got it wrong. Distractor D was a strong contender with the correct response. It will be important to determine why this is the case. Distractors B and C proved to be of the same strength.
B	1447		
C	1311		
D	3050		

28 This is a typical comprehension item that required the candidates to identify resources that are critical when starting an agribusiness.

Option	N	Key	Comment
A	779	D	Less than 50% got this item correct. Distractor B appears to be an equal contender with the key. It should be of keen interest to find out why candidates thinks that marketing skill are a reason requirement for one to start an agribusiness
B	6260		
C	372		
D	4012		

29 This is a high-level comprehension item that requires the candidates to explain the statement elasticity of demand equals one signify.

Option	N	Key	Comment
A	3078	D	Only a small proportion of the candidates got the item correct. Distractor A and B seemed to be strongly appealing to candidates who got this item incorrect. It is very clear that this is not a familiar concept for most the candidates
B	4635		
C	1001		
D	2708		

30 This is a high-level application item; candidates are given some farm record entries and are required to identify the correct presentation of the farmer's balance sheet.

Option	N	Key	Comment
A	1633	B	A significant number of the candidates managed to identify the correct balance sheet for the farm. Those who got the item incorrect were fairly distributed across the distractors. A significant number of candidates seem to have a poor understanding of the concept of balance sheet. Therefore, emphasis should be made during instruction.
B	6225		
C	1643		
D	1921		

31 This is a typical comprehension question on genetics soliciting understanding of important genetic concepts by the candidate.

Option	N	Key	Comment
A	5197	A	Only a small proportion of candidates got this item correct. The rest were evenly distributed across the distractors. This indicates that the understanding of candidates on these genetics concepts is very poor. Distractor D was the weakest link and did not appeal to candidates who got this item incorrectly
B	2795		
C	3012		
D	418		

32 This is a typical application item searching for the understanding of the candidate of the genetic ratios when cross animals of different phenotypes.

Option	N	Key	Comment
A	2094	D	This item was poorly done only 14% of the candidates got the item correct. The rest of the candidates were spread fairly spread across the distractors. However, distractor B was very attractive to candidates who did not know the correct answer. Perhaps there is a common misconception regarding it.
B	5006		
C	2779		
D	1543		

33 The candidate is presented with a breeding scenario practiced by the farmer. The candidate is required to speculate on the type of problem that might arise from practicing the method of breeding

Option	N	Key	Comment
A	6653	A	Most candidates correctly answered the item. The rest were fairly distributed across the distractors. Distractor C was the weakest option and did not draw as much of the candidates who got this item incorrect as the other distractors
B	1196		
C	962		
D	2610		

34 This is a high order item that required the candidates to deduce from the scenario presented what the farmer could do to solve the soil problems.

Option	N	Key	Comment
A	1787	A	Most of the candidates got this item incorrectly. The candidates who did not get the item correct were spread across the distractors with distractor B capturing the attention of most candidates who answered this item incorrectly. There is a need to establish a reason why this is the case.
B	7209		
C	1304		
D	1119		

35 This is a typical application question that requires the candidates to demonstrate their understanding of the four-stroke diesel engine.

Option	N	Key	Comment
A	2868	C	Only a third of candidates got this item correct the rest were fairly spread across the distractors. Most candidates have a poor understanding of the functioning of a fours stroke diesel engine.
B	2965		
C	4172		
D	1412		

36 This is a simple comprehension item requiring the candidate to demonstrate understanding of the electrical system of a petrol engine.

Option	N	Key	Comment
A	1648	A	The item was poorly done by most of the candidates, in fact only 14% of the candidates answered this item. A large number settled for distractors B and D. Distractor C was very weak and did not appeal to candidates that got this item incorrectly
B	5443		
C	947		
D	3378		

37 This is an application item that presents a drawing of an animal handling structure and requires the candidate to demonstrate understanding of how the animals enter and leave the animal handling structure.

Option	N	Key	Comment
A	1196	D	Most candidates got the item correct. Options B and C proved to be the weakest distractors and were rejected by most of those who did not know the answer. Distractor A however, was more appealing to the candidates who did not know the answer.
B	182		
C	364		
D	9666		

38 The based on the diagram of the animal handling structure presented the candidates, were expected to deduce the function of the part labelled X. This was a simple application of knowledge on animal handling structures.

Option	N	Key	Comment
A	352	D	The item was well attempted by most candidates. Distractor C is the only one that was more appealing to candidates who do not know the correct answers. While distractors A and B proved to be very weak and not appealing to most candidates who did not know the correct answer.
B	791		
C	1090		
D	9168		

39 This is a simple application item presenting the candidate with a plant under an irrigation system. The candidates are expected to deduce from the illustration the type of irrigation in operation.

Option	N	Key	Comment
A	1453	D	The item was fairly attempted by the candidates. Half of the candidates did not know the correct answer. This shows that the candidates lack understanding on irrigation. Distractor C was an extremely strong distractor that posed strong competition with the key. Distractor B was the weakest distractor.
B	798		
C	3701		
D	5425		

40 This is a typical application question on tractor maintenance routine requiring the candidate to do trouble shooting and to recommend the measure that might be taken to restore normal operation of a tractor.

Option	N	Key	Comment
A	2462	D	More than 50% of the candidates managed to trouble shoot and to recommend the appropriate action to be taken to restore normal operation of the tractor. Distractor C proved to be the weakest and did not attract as many candidates as did the other distractors
B	1749		
C	687		
D	6263		

Paper 2: Written

Section 1: General Comments

Performance for this year's cohort indicated that it was somewhat better as compared to that of the previous year. The 2023 paper compared to the 2019 paper was found to be more difficult because a total of 11 marks were not easily accessible in the 2023 paper. This came as a conclusion after assessing corresponding questions i.e., questions from the same topic for both 2023 and 2019 papers. The quality of work of the 2023 cohort when compared to 2019 cohort was somewhat better as evidenced by the presentation of their work, whereby most candidates did not have any blanks where questions were left not attempted. There was a logical presentation of responses by most candidates and most candidates were able to observe rubrics. The most common essay questions that were answered by candidates were questions 9, 11, 12 and 15 while the least common questions were questions 10, 13 and 14.

Section 2: Comments on Individual Items

Section A

1 (a) (i) This item was well answered. Most candidates gave a correct response as class VI, hence getting the 1 mark allocated but a few gave incorrect responses such as class IV, and class VII.

(ii) This item was well done. Most candidates were able to suggest the correct uses of class VI cued by the land features given as range/grazing/ pasture; wildlife; forestry/ tree planting/ forests/ woodland/woodlot; recreation.

(b) This item was well done. The item used a forested land as a stimulus material. The item required candidates to outline the activities that should be carried out to make the land ready for planting. Most of the candidates were able to give the expected responses as clearing; stumping/ destumping; ploughing; discing; harrowing.

2 (a) This item was poorly done by most candidates. The item required candidates to state why water is needed for germination. The common incorrect response was to moisten the seed. The expected response was: it provides medium / solution for enzymes / sugars to work / for hydrolysis / softens seed coat for plumule/ radicle to emerge;

(b) This item was fairly done. The item required candidates to suggest environmental factors modified by mulching as cued by fig. 2.1. Most candidates gave a correct response as high temperature/ temperature; low rainfall; low humidity; strong/winds. However, some candidates wrote phototropism, incorrect responses such as reduces transpiration/ evaporation.

(c) This item was well answered. The item required the candidates to Most candidates gave correct responses such as prevents high temperature damage / excessive wilting/ transpiration/ evaporation / wind damage; for optimum /improved growth.

1 mark was given for factor and the other mark for linked explanation.

3 **(a)** **(i)** The item was well answered. Most of the candidates were able to give the correct response as fertilisation.

(ii) The item was well answered. Most candidates gave correct responses of the parts of the flower shown as:

part **X** – stigma

part **Y –** style

part **Z –** micropyle / ovule

(b) The item was poorly answered. Most candidates simply described the process of fertilisation in plants instead of describing how a seed if formed as required by the question.

The expected response was fertilized ovule develops into embryo; differentiates into plumule and radicle; cotyledon surrounds embryo; outer wall develops into testa.

(c) **(i)** The item was well answered. Most of the candidates were able to state the type of pesticide cued by fig. 3.2 as selective herbicide. However, a few candidates wrote incorrect responses such as contact, stomach and systemic herbicides.

(ii) The item was well answered. Most of the candidates were able to state the plants that will be killed by MCPB herbicide as S & T. however, some candidates wrote either of the plants which lead to loss of credit.

(iii) The item was poorly answered. Most candidates gave incorrect responses such as it kills weeds, kills all weeds, does not require more labour, etc, which resulted in loss of marks. The expected responses were as follows: it kills weeds faster/quick / efficient weed control; it promotes minimum tillage / conserves soil moisture; effective in controlling weeds in cereal crops; it gives nearly complete weed control/effective; it can be used in areas where other methods are practically impossible; it maintains good soil structure; effective in controlling perennial weeds.

4 **(a)** The item was well answered. Most of the candidates were able to give the correct response as potting/potted/pot plant.

(b) The item was fairly answered. Some of the candidates simply interpreted the stimulus material by stating that pot G lacked drainage holes instead of stating the danger of growing plants in the pot. Some candidates failed to write complete explanations of the danger of planting the plants in the pot, for example responses such as lead to occurrence of fungal diseases. Such responses attracted 1 mark only since the other mark would be for justification. The expected responses for this question were: water logging / poor drainage / lack/poor aeration; leading to stunted/poor growth/poor respiration / occurrence of fungal diseases / poor root growth/ death of plants/ rotting of roots.

5 **(a)** **(i)** The item was fairly answered. Some candidates stated meanings of related terms such as range, forage, or fodder. The expected response was an area planted with plant species to feed livestock/ cultivated forage plants /AW.

(ii) The item was fairly answered. Most of the candidates wrote methods of establishing lawn grasses such as sodding or plugging. The expected response was vegetative propagation / asexual reproduction.

(iii) The item was well answered. However, a few candidates wrote spread by stolons as their responses which was wrong. The expected response was perennial; deep rooted; spread by rhizomes.

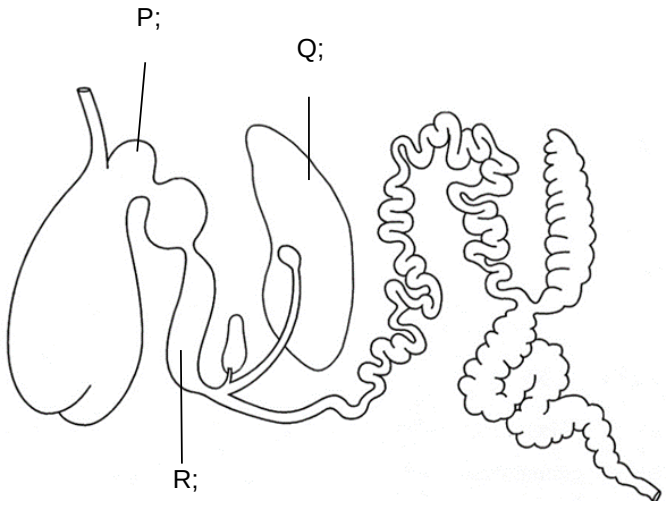
(iv) The item was poorly answered. Most of the candidates wrote wrong responses such as goats would cause overgrazing, while others were clueless about the concept as they simply wrote the features of the grass described in the information given as their responses. A few of the candidates wrote correct response as goats not suited for available forage / they are mostly browsers.

(b) **(i)** The item was fairly answered. The item required candidates to explain how the grazing method illustrated improves pasture utilisation. Most of the candidates wrote responses such as prevents overgrazing or allows regrowth of pasture without justifying how, hence could not access full credit for the question. 1 mark would be for factor and the other mark would be for a linked justification. The expected responses were as follows: it confines animals in a small area; reducing selective grazing/ minimizing pasture wastage/ under grazing; the use of movable back fence; prevents premature grazing of re-growing plants/allow regrowth of pasture; uses correct stocking rate; reducing overgrazing/under grazing.

(ii) This item was well done. This item was open to two interpretations, either to stock the pasture using the illustrated grazing method or to stock entire pasture oblivious of the grazing method. Most of the candidates were able to present comprehensive workings to calculate the maximum number of sheep that should be kept without causing pasture deterioration.

NB: The candidate was required to show correct working to score **two** marks and one mark for the correct answer.

6 **(a)** **(i), (ii), & (iii)**: This item was poorly answered. The item required candidates to draw lines on fig 6.1 to show digestive parts for stated physiological functions. Most of the candidates failed label the correct parts. For P, the common response was a line showing omasum while most of the candidates were clueless about the location of part R. Some candidates failed to observe the rubric for the item whereby label letter were written in the digestive parts. The expected responses were as follows:



(b) (i) The item was poorly done. The item required candidates to state possible genotypes of the pure-bred potato plants of the same variety. Most of the candidates wrote different homozygous genotypes for the potato plants which was wrong. The expected response was potato plant 1: HH, potato plant 2: HH. Any homozygous genotype would be acceptable provided it is the same for the two potato plants, for example tt and tt, TT and TT, respectively.

(ii) The item was fairly done. The item required the candidates to suggest non genetic factors that could have caused the difference in size of the potato tubers. Most of the candidates wrote incorrect responses such weather. Some candidates wrote different elements of climate as different answers, hence could not access full credit. The expected responses were differences in climate/ temperature / rainfall; nutrition / soil fertility; diseases; pests; management; soil type.

(iii) This item was poorly answered. The item required the candidates to explain ways of improving the potato tubers of plant 2 based on the scenario given. Most of the candidates suggested crossing potato plant 1 with potato plant 2, while others suggested use of a gene for large tubers from the wild local potato which were incorrect. A few of the candidates suggested some management practices such as fertiliser application and irrigation which evidenced that they were clueless about the concept cued by the stimulus material. The correct responses expected for this item were as follows: through hybridization /cross breeding the local wild potato with the potato plant; to improve adaptability of the potato plant/ improve size of tubers; inserting desirable genes of the local wild potato into the potato plant; to make it adapt to the local conditions/to improve size of tubers.

NB: 1 mark was given for a correct way suggested to a maximum of 2 marks while 1 mark was given for linked explanation. A wrong way or no way suggested, a zero was awarded.

7 **(a)** This item was well done. Most candidates could give the correct response as financial record.

(b) This item was fairly done. Most of the candidates did not calculate the amount for each entry. Some did the calculations in the table in the column titled amount. Workings of amounts were done but calculated amounts for entries were not shown in the table. For computations of total costs amount for drugs and vaccines was not added which resulted wrong total costs and subsequently wrong profit. The expected responses were as follows:

Costs		Returns	
item	amount (P)	Item	amount (P)
drugs and vaccines	**200**	8 bags of manure	400
100 day old chicks	500	100 broilers	5500
10 bags of feeds	2500		
permanent labour	1600		
annual tax paid	300		
Total costs	5100;	Total returns	5900;

(c) The item was well done by most of the candidates who were able to complete the record correctly as shown. Most of the candidates demonstrated sound knowledge of calculating profit or loss by presenting correct workings.

P5900 – P5100.

P800.

(d) This item was poorly done. The item required candidates to suggest a reason for not including permanent labour and annual tax when determining gross margin. Most of the candidates wrote incorrect responses such as they are fixed assets, they do not change or do not change with time. The expected response was they are fixed costs.

8 **(a)** **(i) & (ii)** This item was well answered by the cohort. Most if the candidates were able to give correct examples of farm implements such as planter; plough; harrow; cultivator; or subsoiler; and farm machines such as tractor; combine harvester; lawn mower; drilling machine; hammer mill. However, a few of the candidates defined the terms farm implement and farm machine instead of giving examples.

(b) **(i)** This item required the candidates to name the part labelled L in fig 8.1. Most of the candidates wrote the correct response as water pump/impeller; Some candidates were clueless about part L and wrote incorrect responses such as thermistor.

(ii) This item was fairly answered by the cohort. The question required candidates to state the significance of the part labelled K. Some of the candidates wrote function of the fins such as increases the surface area for cooling while others gave incorrect answers such as it cools the engine. The expected response was; reduces temperature of coolant / cools water;

(iii) This item was fairly answered by the cohort. The question required candidates to describe the routine checks performed on part K before operating the tractor. Some candidates gave general routine checks with reference to the cued part. The expected responses were as follows: check for leaks; check coolant level; check blockage; inspect radiator cap.

(iv) This item was poorly done. The item required candidates to suggest two things that should be done to solve overheating of the engine. The common incorrect responses were pour water on the engine, add oil, switch off engine, allow engine to cool, park tractor in the shade. The expected responses were as follows: clean radiator; seal leakages; replace radiator cap; add/refill/top-up coolant/water; replace water pump; lubricate water pump; replace hoses; adjust tension of fan belt; replace fan belt; replace thermostat; maintain the lubrication system/change/refill engine oil/change oil filter/replace oil pump/clean oil sump.

Section B

9 **(a)** This item was popularly attempted by most candidates who attempted it as they could outline the characteristics of commercial farming as: production of crops / animals on a large scale/large area; for sale/make profit; high capital investment; high output; uses advanced technology; high/intensive use of inputs; use of skilled labour.

(b) This item was well done by most of the candidates who attempted it. Candidates were required to state an impact to score one mark and its linked discussion to score the other mark. Most candidates were able to state the correct impacts of commercial farming and discuss them correctly as shown:

impact	discussion
pollution;	due to use of farm chemicals/ improper disposal of chemical containers/ kills beneficial organisms/ exhaust fumes/loud sounds;
loss of habitat;	due to land clearing/ deforestation/ loss of biodiversity;
imbalance ecosystem;	due land clearing;
loss of biodiversity;	due to land clearing / pollution / deforestation;
global warming;	due to: land clearing /deforestation / / fumes from engines;
soil erosion;	due to land clearing/over grazing/continuous cultivation;
build-up of pests;	due to monocropping;
development of resistant pests/ weeds;	due to continuous use of pesticides/ herbicides/ due to genetic engineering;
development new species;	due to biotechnology;

depletion of ground water/ water;	due to increased irrigation/reduced infiltration/ continuous pumping;
salinization of soil;	due to use of in organic fertilisers / irrigation;
deforestation;	due to clearing large areas of land;
desertification;	due to continuous overgrazing/soil erosion/deforestation/land clearing;
destruction of soil structure;	due to heavy machines/ continuous cultivation;

NB:1 mark was given for impact and 1 mark was given for correct linked discussion.

10 **(a)** This item was not popularly attempted by the cohort and was poorly done by candidates who attempted it. The expected response was as follows: price; price of related goods; consumer's income / income; population; advertising; taste / preference; religion / beliefs / customs; season / weather; quality.

(b) This item was poorly done by the cohort. The candidates could not explain how supply and demand can determine the equilibrium price. The expected responses were: results from the interaction of the forces of supply and demand; competition between consumers for limited supply forces the price up; competition between sellers force price down / AW; occur until an equilibrium point is reached; at the equilibrium point/where quantity supplied equals quantity demanded / point where supply and demand curves intersect; price at equilibrium point.

11 **(a)** This item was popularly attempted by the cohort but poorly done by most candidates who attempted it. The expected response was as follows: animals graze / browse on large area; consisting of natural vegetation; no fencing / animal movement not controlled / restricted; continuous grazing is used; herd boys are used to look after livestock; overstocking.

(b) This section of the question was well done. Candidates were required to state a method to score one mark and its linked explanation to score the other mark. Most candidates who attempted the question could explain how range utilisation can be improved as follows:

method	explanation
applying fertilizers/ liming;	to encourage/improve rapid growth/growth of vegetation;
fencing;	to conserve range for dry season / practice rotational grazing / rest range;
clearing unwanted bush;	to encourage regrowth of palatable / desirable plant species;
reseeding using improved / more nutritious species / legumes;	to increase nutritional value of range;
irrigation;	to encourage all year growth/growth on vegetation;
controlled burning;	to control unwanted woody species;
mixed species grazing;	to avoid overgrazing of certain of range plants / selective grazing;
controlled grazing/ rotational grazing/ zero grazing/strip grazing;	to avoid selective grazing/allows regrowth of vegetation;

destocking;	to reduce overstocking / overgrazing;
supplementary feeding;	to reduce overgrazing during dry periods;
practice soil conservation;	to prevent soil erosion / encourage vegetation to restore itself;
practice correct stocking rates;	to avoid overgrazing/under grazing;
even/ adequate distribution of watering points;	to avoid localised overgrazing;
fodder conservation;	to avoid wastage/ reduce overgrazing during dry periods;

NB: 1 mark was given for method and 1 mark was given for correct linked explanation.

12 (a) This question was well done. The item required candidates to outline the importance of lawns. Most candidates were able to present the expected responses as follows: screen out unsightly area; make area beautiful; prevent soil erosion; add value to estate; reduce mud / dust; provide ground for recreation/leisure/relaxation; cools environment/ microclimate; reduce noise; reduce glare; Four marks were awarded for any correct four points.

(b) This section of the question was fairly answered. The candidates had to discuss lawn management in relation to edging, scarification and weed control. Most candidates failed to discuss the lawn management activities. The expected responses were as follows:

Edging - cutting away turf which has grown beyond boundaries; make neat boarders; using edging shears / lawn edger/ long handled shears / mechanical edging tool/ half-moon edging iron /edging knife/edging iron/ named appropriate tool.

Scarification- removing dead undergrowth / grass/ rhizomes / thatch from the lawn; improves growth/controls pests/diseases/improve air circulation/drainage/infiltration; using a spring tine rake / wheeled scarifier.

weed control- practices done to maintain a thick/ healthy/competitive/ weed free turf; improves growth/ reduce competition for growth resources/ prevents pests/diseases; by allowing the land to fallow before establishing turf/ maintaining a healthy turf/ hand pulling / uprooting weeds with tools/ using selective herbicides for broad-leafed weeds / 2, 4 – D / 2, 4, 5 – T/MCPA/MCPB / duron / simazine / avoiding use of kraal manure/ frequent mowing/ proper fertilising / proper irrigation.

13 (a) This question was poorly done by the cohort. The item was least preferred by the candidates. Most candidates who attempted it failed to outline the importance of controlled breeding. The expected responses were as follows: improve quality of products / named products; improve yield; increase economic benefits/ improve resistance/ tolerance against disease/ parasites/ pests/heterosis/hybrid vigour; improve tolerance/resistance against adverse conditions/named adverse condition; form new breeds; maintain pure breeds; perpetuate species; eliminate undesirable traits; improves growth.

The candidates scored four marks for any correct four points.

(b) This section of the question was fairly answered by the cohort. Some candidates who attempted this item failed to discuss cross breeding as a method of livestock improvement. The expected responses were as follows: mating of different/ breeds / relevant example; produces a hybrid; offspring produced have hybrid vigour; produces new genes / genetic variation; may hide undesirable traits; create new breeds; offspring produced do not breed true to type; requires skill / knowledge; it is expensive.

The candidates had to state any **six** correct points obtain a maximum of six marks.

14 **(a)** The item was most preferred amongst the cohort. This section of the question was well answered by most candidates who attempted it. The item required candidates to outline the stages in the construction of a wire fence. The candidates were able to present the expected responses as follows: locate corners; clear fence line; mark positions of posts; dig holes; place posts in holes; brace corner posts/grate posts/strainers; firm soil around posts/ pour concrete; fix wire on posts; strain wire/ pull wire tight; staple wire onto posts; place droppers between standards; insert/ hang gate.

The candidates scored **four** marks for any correct four points.

(b) This section of the question was poorly done. The item required candidates to discuss in detail two methods used to treat wooden fence posts. The candidates had to state a method to score one mark and its corresponding discussion to score two marks. The expected responses were as follows: vacuum/pressure treatment; poles are peeled; tightly packed in a large cylinder; chemicals forced directly into poles under high pressure.

or

hot soaking / hot and cold treatment; poles are peeled; submerged in oil drum/tank containing preservative/named appropriate preservative; container heated until preservative is about to boil/for about 2 hours; allow the posts to cool in preservative; posts absorb preservative while cooling.

or

cold soaking; poles are peeled; immersed in container with preservative/ named appropriate preservative for a few days/ 1-3 days; chemical drawn up slowly into conducting tubes of the wood; posts are removed and allowed to drip dry;

or

end diffusion/sap displacement; freshly cut posts packed in a tank containing preservative/named appropriate preservative; for about 10 days; posts are turned upside down; until enough preservative is taken in; preservative is drawn up as sap dries/ by transpiration stream.

or

drying; fresh poles are air dried; under a roofed shed/away from direct sunlight/ rain; poles supported off ground.

or

superficial treatment; involves dipping/spraying/brushing preservative on posts; apply preservative on clean/dry surfaces; give at least two coats; allow first coat to dry before applying second one; apply preservative.

15 **(a)** This was one of the most preferred items amongst the cohort. Most candidates who attempted it performed well. The section of the question required the candidates to outline the necessary precautions taken when storing pesticides. Most candidates could outline the necessary precautions as follows: follow the manufacturer's instructions; keep chemicals in their original containers; store chemicals in labelled containers; store in tightly/firmly closed containers; store chemicals in a locked / room / cupboard; store chemicals and protective equipment in different locations; do not store liquid chemicals above solids; separate different chemicals; have mop-up materials /sand/ soil / dry sorb on hand; store chemicals in a well-ventilated area; store in a cool area / dry/ away from direct sunlight/ at recommended/suitable temperature; keep out of reach of children/pets / keep in high shelves.

The candidates scored four marks for any four correct points.

(b) This section of the question was well done. The item required candidates to explain how a knapsack sprayer is calibrated before spraying a pesticide in a known area. The candidates could explain the calibration of a sprayer as follows; measure the test area; fill the sprayer / tank with a known volume of water; spray over the test area at normal / constant speed; maintain constant/normal height when spraying; measure the amount of water remaining in the tank; determine the volume of water used / subtract the final water volume from the initial water volume; calculate the spray rate / spray volume.

The candidates scored six marks for any six correct points.

Paper 3: Coursework

Introduction

A total candidature of 11, 851, was registered for this component in the year 2023, which is a slight increase as compared to the 2022 candidature. Just like the previous year, moderation-verification model was used to establish the correction factor for centres. The centres' scaling factors are important as they are used to establish the trend of marks awarded by teachers in comparison to moderators' marks per centre across different strata.

The research project performance for the 2023 cohort of candidates was slightly better compared to their 2022 counterparts as most centres maintained their centre marks after scaling. On the other hand, the un-moderated practical test marks continue to inflate the overall marks of this component as almost all candidates scored very high marks on the practical tests.

There is slight improvement in addressing project variation and creativity as the candidates made an attempt to formulate new unique research topic. This is a welcome development; centres are encouraged to nurture this attainable effort of breaking the usual monotonous fertilizer-trial research topics. However, such centres derailed from the project marking guide.

There was slight increase in the number of **survey** projects; six (6) centres for 2023 cohort as compared to the previous year. Just like previous year only **one (1)** centre registered a livestock related research and once again centres are urged to support and assist candidates who are keen to undertake animal related research especially those centres keeping livestock. Majority of project reports were handwritten though the number of **typed** projects increased in 2023. Centres are urged to take the advantage of government school digitalization initiation which is currently on-going and assist candidates to submit typed project reports. Such projects are usually neater and well-illustrated, and it becomes easier to score high marks.

PART 1: GENERAL OBSERVATIONS

1.0 Summary mark sheets

1.1 In 2023 thirty-six (36) centres submitted summary mark sheets except two (2) centres.

1.2 Only one (1) centre submitted summary mark sheets which had three (3) columns instead of the correct version with **four columns**. Centres are to ensure that the correct summary marksheet has been used.

1.3 One (1) centre filled the last column of totals, and it was requested to re-fill the summary mark sheets correctly (leaving the total mark column blank for external moderators' use only). One (1) centre did not round up the practical test marks as expected; the marks should be rounded-up upon filling them.

1.4 Five (5) centres submitted summary mark sheets without Chief invigilator's signature appended against absent 'A' candidates. This should be attended as a matter of urgency.

1.5 Chief invigilator and Senior Teacher should write their names and append signatures on the spaces provided at the end of the summary mark sheet. Unfortunately, this was not the case with four (4) centres.

1.6 There was a great improvement in accessing summary mark sheets and other deliverables unlike in the previous year. Centres are commended for separating these important documents (summary mark sheet, attendance register and centre order of merit) from the candidates' folios when packaging. This should be maintained.

2.0 Attendance register

2.1 Two (2) centres failed to submit attendance registers for this component on time. It is very important to submit attendance registers along with the projects to confirm the physical count of the projects. One (1) centre completely failed to submit the attendance register despite follow ups. Note that such practices violate examinations standards and guidelines as such relevant authorities were notified.

2.2 Generally, the attendance registers were completed correctly. Note that only letters '**A**' and '**P**' for Absent and Present respectively are supposed to be written. Just like in the summary mark sheets 'A' should be signed for by chief invigilator. Likewise, candidates should sign on the last column designated for candidates' signature.

3.0 Organising, Packaging and Binding of Scripts

3.1 Centres continue to improve tremendously as far as packaging is concerned, they submitted their project in proper packaging materials supplied by BEC. The following deliverables are expected when submitting the projects:

- summary mark sheets
- attendance register
- centre order of merit
- practical test forms
- assessment forms.

These documents should be packaged separately from the research projects boxes. The mentioned items should be put in their individual sealed envelopes for ease of checking on a delivery.

3.2 However, some centres continue to use very big boxes leading to dismantling of projects due to tilting or tearing of boxes during lifting and transportation. The centres are therefore advised to put the project on labelled BEC sealable envelopes prior to putting them inside the box or use small portable boxes. Each envelope must be labelled **subject name and component code**, **centre name and number**, **specificity of contents** in that particular box or envelope; **range** of candidates' numbers in each packet; **absentees** within each range and **serial numbering** of packages, for example 1 of 5 as well as the **actual total number** of the projects in each pack to ease tracking and accessing the projects prior to marking. Candidates' scripts, practical test forms and assessment forms should be arranged in numerical ascending order.

3.3 Most centres used popular quotation files as they are cheaper and most effective in binding project. However, one (1) public centre still used Manila paper files for binding student's projects while two (2) centres used sliding binders. The use of manila files disadvantage candidates as some place their cover pages underneath or if glued on top increasing the chances of those candidates losing marks due to untidy cover pages. Likewise, use of sliding binders, transparencies, and frosted sheets to bind projects fails to secure the project leading to moderators picking and arranging candidates' project. This is worrisome as the duty of the moderator is to mark the candidates work as it is.

3.4 Two (2) private centres pasted a 'course work sticker' on the outer cover of the project as a result candidates lost 2 marks on the cover page. Centres should desist from pasting stickers or course work labels on the transparent front cover.

4.0 Evidence of Internal Standardisation at Centres

4.1 There was evidence of standardization for most centres. The correction factor for 10 (upper stratum), 17 (middle stratum) and 20 (lower stratum) centres fell on the allowable difference of +/-5 indicating that Centres seemed to have read and adhered to the Project Marking Guide as well as previous Principal Moderators' Reports. However, some centres had candidates awarded 75/75 and when sampled and checked, lower marks were scored by those candidates. Almost all centres, the marks for upper stratum were inflated hence scaled down while the lower stratum marks were harshly pulled down prompting positive adjustment.

4.2 This year's cohort was like the 2022 cohort in terms of adjustment factor: **negative** adjustment for high achievers' group; **maintained** centres' marks for middle stratum and **positive** adjustment for low achievers' group across the centres. However, it is worth noting that in some instances the huge correction factor was influenced by small sample size.

5.0 Practical tests forms

5.1 Unlike previous years appropriate forms were used except one (1) centre. The following information must be fully filled: full names of candidates; dates of assessment for each practical test/ activity, name, and signature of internal moderator **among others**. Centres should enquire and ensure that correct forms are used.

5.2 Nine (9) centres assessed less than 4 critical activities while one (1) centre had more than one practical test from the same module leading to heavy penalties imposed to ensure fair assessment across all the candidates.

5.3 In one centre wrongly computed the marks (failed to scale-down the marks) while two (2) centres did not average the marks awarded under each of the 5 marking criteria. Blue or black ink pens were also used to enter the marks instead of red ink pen.

6.0 Centre Order of Merit

6.1 Centre order of merit was introduced in 2019 whereby centres were requested to rank project marks from the highest to the lowest and this year all the centres complied. Unfortunately, four (4) centres ranked using total marks instead of project marks.

6.2 If centres need clarity on the role of the centre order of merit, refer to: 2019 Principal Examiners Report; page 21-7.2, 3.

PART B: INDIVIDUAL REPORT COMPONENTS

1.0 Cover Page

Marks were lost for *symmetry, lettering,* and some instances *neatness* due to cancellations especially handwritten reports. Private Schools lost marks on *required information* as they pasted 'course work stickers' obscuring the information on the cover page.

2.0 Title Page

- Marks were lost on the following: *symmetry, lettering, and neatness*. As usual handwritten project reports were mostly affected.
- Some topics were not *descriptive and short* as they lack specific name of fertilizer (LAN, NPK).

3.0 Acknowledgements

This section was well done by most candidates. However, some candidates mentioned general *services* rendered without full names.

4.0 Table of Contents

- Acknowledgement page was in some cases misplaced (placing this page after the table of contents) as a result marks for *all headings in order* were deducted.
- For *page numbers and leader dots* most candidates did well except those who numbered acknowledgement as II instead of ii or put range of numbers. Some candidates still used leader circles instead of dots while others placed dashes or dots underneath the page numbers.
- Most candidates (handwritten reports) lost marks on *lettering* due to the way they wrote certain letters/characters. The same letters spelled out in 2019 Principal Examiners Report, pages 23 and 24 still cost candidates marks.
- Some candidates failed to *indent* the sub-headings.

5.0 Introduction

5.1 Statement of problem

(a) **Experimental research**: Candidates failed to specify observation of the problem identified especially topics on yield. A mark for possible cause was lost as some candidates failed to specify

the nutrient element lacking in the soil. Some few private candidates failed to state the place where the *problem was identified.*

(b) **Survey research**: Fewer candidates failed to fully outline the unfolding events as well the positive aspect for *why its needs studying* as compared to previous years.

5.2 Literature review/ Related research

(a) **Experimental**: Most centres that had experimental research used related research. Although they did well in citations and formatting, some lacked specific treatments and control while others lacked concluding statements.

- It is worrisome that candidates who used textbooks, quoted information that was doubted therefore, needed to be substantiated while a few quoted research projects from 2013 onwards. Faked information/ literature lowers the quality and general standards of the literature review presented.
- Centres are encouraged to use other sources of literature such as internet to lessen relying on outdated and irrelevant textbooks or unavailable past BGCSE research projects.

(b) **Survey:** Textbooks were commonly used but lacked place and target group leading to loss of marks under *relevant major findings*.

(c) **Importance:** Just like in the previous years, how the beneficiaries were to benefit was not clearly explained for both experimental and survey research projects. It was not clearly indicated as how the study will solve the identified problem(s).

5.3 Objective

(a) **Experimental**: Some objectives were not relevant to the research topic and lacked clarity especially those on yield, candidates failed to specify parameter measured. In some instances, the growth parameter was not specified and/or the principal part measured on the crop was not stated.

(b) **Survey**: The objectives were well written.

6.0 Materials and Methods

6.1 Description of site

(a) **Experimental:** Just like in 2022 the *location of site* and *history of use* were well done. However, the *features of site* mentioned lacked direct impact/effect on the crops or the outcome of the study. Teachers are urged to assist candidates to state a feature(s) which has a **direct** effect on the study as this criterion has as far as year 2015 not been properly addressed for example ‘how was the feature likely to affect growth/yield/biomass etc’.

(b) **Survey**: For location, some candidates focused only on the name of the cattle post without district or village. Refer to the Research Project Marking Guide - 2016, page 19.

6.2 Design of experiment

(a) **Experimental:** Candidates did well in mentioning the treatments, size of units and replication of units. N.B. if no replication was done, it should be explained; page 20 0f 36 Research marking guide.

- Randomization is still a challenge to most of the candidates. For balloting method, it was not clear about what was decided with regards to allocation of treatments to the experimental units after the ballot papers were unfolded. Candidates should clearly explain the outcome of method used and when deciding which units were used for what treatments as guided by the outcome.
- For description of layout some candidates failed to label at least 2 dimensions for **each unit drawn** refer to 2018 Principal Examiners Report, page 22. The candidates who had drawn a block of four plots failed to label the middle plots. The key/legend lacked the specific names of test and control treatments.

(b) **Survey**: Despite an improvement on the depth of coverage, some candidates either wrote mere statements or questions different from the ones listed in the questionnaire. The expectation is to write a summary of **questions in the questionnaire** instead of **pasting** the whole questionnaire.

6.3 Procedure

(a) **Experimental**: Conduct of treatment was well explained.

- Majority of candidates did not access the mark for precaution as either no attempt was made or those who attempted stated the precaution related to conduct of control.
- Some candidates failed to fully describe the activities performed (pre-/post-treatment).
- For materials and tools, some candidates lost marks because tools were missing under conduct of treatments. Note that to access full marks at 6 iii (d) candidates should mention materials **and** tools. Hands, trowel, spade etc. are accepted as tools used.

(b) **Survey**: Actual administration of the instrument was well mentioned (mostly questionnaire interview).

- For survey research, materials **and /or** tools should be mentioned in all the 3 operations. Printers, computers, scanners, printing papers, binders' and others are acceptable as tools/materials used.

7.0 Methods of Observation, Data Collection and Analysis

(a) **Experimental**: The following criteria were well done, type of measurement, name of equipment and how parameters were presented.

- However, *specification of equipment* was not stated by some candidates. There were instances where the degree of accuracy mentioned was different from the minimum quantity the tool could measure.

- Candidates failed to describe how sampling was done.
- **How measurements were taken**: it was not clear as to how the parameters were measured hence candidates only accessed the mark for the precaution. Few candidates presented a diagram unfortunately some diagrams lacked appropriate labels.
- **How analysis was done**: Some formulas were wrongly done as candidates displayed poor mathematical concepts when conceptualizing a formula. General formula should be accompanied by a description written in the context of study.

(b) **Survey:** The following criteria were well attempted: type of measurement, name of equipment and specification, sampling and how parameters were presented.

- How measurements were taken: For candidates who used tally marks, they were not explicit as to where the tally marks originated from. Some candidates failed to mention the method of data collection.
- Table was the most common form of presentation and is seemed to be user friendly to most candidates.

8.0 Results

- Relevance of opening statement and titles of graphs or tables of results were well done by most candidates. However, duration of data collection was lacking consequently losing marks for validity and reliability.
- Labelling of form of presentation: Some candidates presented tables with only one axis/column heading without row heading.
- Neatness: Marks were lost in an account of overwriting, tables drawn on the page margins and repetition of units of measure in the same form of presentation especially handwritten reports.
- For results in line with data collection and form of presentation, marks were credited to most candidates.
- Credibility of results: There were slight improvements in this section of the results even though some wrong computations, wrong formulas, no appendix, and presentation of raw data lead to some candidates losing marks.

9.0 Discussion

- Some candidates failed to score marks for addressing results as they quoted different figures from those in the results section or lacked interpretation of quoted figures.
- Explanation of results seemed to be a challenge to some candidates as they failed to link the nutrient element to the fertilizer added. Few candidates were awarded marks as they mentioned non-treatment factors.

- Marks were lost for correlation because candidates were marked down for relevant major findings at the literature review consequently losing marks for flow of information.

10.0 Conclusion

- Similarly, as from previous years majority of candidates generally concluded their studies very well.

11.0 Recommendations

- Candidates did well except those who failed to mention the crop at the appropriate action. Some candidates failed to mention the *beneficiary* and *factor* suggested for further investigation.

12.0 References

- Some candidates wrote irrelevant reference mostly authors' name/year appearing in this section differed with the ones in the literature review leading to loss of marks.
- Improper formatting was common (editions of certain books not written, tittles not underlined and wrong punctuations
- For past BGCSE Agricultural Research Projects candidates wrote 'Agriculture Project' instead of Agricultural Project.

13.0 Appendices

Some candidates' results were nullified on the basis of:

- Wrong computations or rounding off in the final answer.
- No specific name of treatments
- No specific crop (experimental)
- Making computations in the raw data table
- Failure to attach questionnaire (survey)
- Failure to state target area and population (survey)