PRINCIPAL EXAMINER'S REPORT

BOTSWANA
EXAMINATIONS
COUNCIL

BGCSE HORTICULTURE

2024

Advancing learning, certifying your future

PAPER 1: WRITTEN PAPER

General Comments

Performance for this year's cohort was somewhat better as compared to that of the previous year. When compared to the previous cohort the 2024 candidates were able to access some marks from questions involving some mathematical calculations and problem solving. The quality of work of the 2024 cohort when compared to 2023 cohort was somewhat better as evidenced by the presentation of their work, whereby most candidates did not leave blanks or did have many questions that were left unattempted. There was a logical presentation of responses by most candidates and most candidates were able to observe rubrics.

Comments on Individual Items

1 (a) (i) This item was fairly done. The item required candidates to name a monocotyledonous horticultural crop. The candidates were challenged with recalling horticultural crops like onion, garlic, yams, pineapple, dates and banana which are monocots. Some candidates wrote responses such as beans and apple. Centres are advised to classify the horticultural crops, especially those which candidates are familiar with.

(ii) The item was fairly done. The item required candidates to outline the differences between monocotyledonous and dicotyledonous crops. The candidates were expected to give differences in terms of leave sizes with monocotyledons having narrow leaves while dicotyledons have broad leaves. The other differences are monocots have parallel leaf veins while dicots have a network of leaf veins. Cambium is absent in roots of monocots while present in the roots of dicots. Centres are advised to inform candidates that when they are asked to give differences they must cover both sides for each point that they give.

(iii) The item was poorly answered. Most of the candidates could only get a correct response for the process being osmosis and defined osmosis instead of describing how water moves into the root by osmosis. The difference in water concentration between the root hair and soil water, being higher in the soil, causes water to move from soil into root. Water moves from cell to cell in the cortex following the concentration gradient until it reaches xylem vessel. Water is absorbed by roots from the soil and transferred as liquid to the leaves via xylem. In the leaves small pores allow water to escape as vapour and CO_2 to enter the leaf for photosynthesis.

(b) (i) This item was well answered by most candidates giving a correct response being sexual propagation.

(ii) The item was fairly done with a lot of candidates giving responses such as it protects plants from harsh weather conditions and help plants grow well. The expected responses were structure in which crops are raised under controlled/modified conditions; light duration/light intensity/temperature/humidity are modified to suit crop production.

(iii) The item was poorly done with some candidates giving responses such as make a slanting line the rootstock and scion, use a tape to join the rootstock and scion. The candidates were expected to describe the process of budding or grafting to get all the marks. The expected responses were budding where one has to identify suitable rootstock from sour orange and vegetative bud/scion from sweet orange. Make a T-cut on the rootstock using a budding knife.

Insert bud/scion into the T-cut and unite the scion/bud to the rootstock using a budding tape. Apply wax over the union.

Grafting: Identify healthy scion from sweet orange and rootstock from sour orange; make a V/slanting cut on both the scion and rootstock; unite the scion and the rootstock; apply grafting tape over the graft union; apply wax over the union.

(c) (i) The item was fairly done. Some candidates gave responses such as movement of food or organic substances in plants. The expected response was transportation of food from the leaves to other parts of the plant which is achieved by utilising energy from ATP or food material is transported into the phloem tissue using ATP energy.

(ii) The item was well done with most candidates noting that as food is manufactured through photosynthesis, chloroplasts absorb sunlight, and water is carried into leaf via xylem vessels. Carbon dioxide has to enter the leaf through stomata. Some candidates struggled with the equation for photosynthesis.

$$6CO_2 + 6H_2O \xrightarrow[\text{light energy}]{\text{chlorophyll}} C_6H_{12}O_6 + 6O_2$$

(iii) The item was poorly done with some candidates failing to address the command word. They were naming the region instead of suggesting how it contributes to plant growth, giving responses such as region X absorbs water while others referred to part Y as region of cell division. The expected responses for X were cell lengthen and increases in size hence increasing root growth. The root is pushed through into the soil to reach for the water to firmly anchor the plant in the soil.

Y enables the root to grow towards gravity; to firmly anchor the plant into the soil / for plant roots to reach for water/nutrients. It lubricates the root tip/the passage of the root through the soil to prevent injury / mechanical damage to the root/ for the root to smoothly grow through the soil/ to reduce friction.

2 (a) (i) The item was well done with most candidates giving the correct response which is digging fork.

(ii) It was fairly answered. Some candidates gave incomplete responses such as to improve aeration, infiltration instead of expected response such as improved aeration leading to root respiration; improved infiltration leading to water availability/reduced waterborne/fungal diseases/root rot/ to the roots leading to good growth; loosen the soil leading to good root development; incorporated organic matter will release nutrients needed for improved growth; incorporated organic matter will increase water retention leading to improved growth;

(iii) The item was well answered by most candidates. The item required candidates to calculate amount of superphosphate to be applied in an area given the recommended application rate.

Answer: 400 g

(b) **(i)** The item required candidates to define earthing up. It was fairly answered with some candidates not being specific on the plant part covered with soil during earthing up. They gave responses such as covering the crop with soil instead of ridging / hilling / pilling / mounding soil up around the base of a vegetable crop.

(ii) The item required candidates to explain the benefits of earthing up on crops. Most candidates failed to address the command word 'Explain' with a factor and reason. They gave responses such as to prevent exposure to sun, protects roots from harsh conditions. The expected response was encouraging better root anchorage; improving growth / yield cover stolon and rhizomes; improving nutrient / water uptake/ yield; prevents greening / exposure to light; improving yield; soil around crop base prevents establishment of weeds; reducing competition/ improving yield.

(iii) Given Urea application rate and spinach yield for different years candidates were required to recommend the application rate at which the farmer should stop increasing the fertiliser applied. The item was poorly answered by most candidates as they could not interpret data provided therefore giving incorrect responses such as 150 kg / ha because too much fertiliser could decrease yield. The answer was 400 kg / ha which is where there is maximum yield.

(iv) The item was fairly answered. Most candidates gave correct responses such as soil acidification; scorching of plants; yellowing of lower plant leaves; browning of leaf margins and tips; black / brown / rotting roots; slow / no growth of plants; leaf drop / shedding.

(c) **(i)** The item required candidates to name two vegetable crops propagated using bulbs. It was well answered with correct responses such as onion and garlic being the common responses.

(ii) The item required candidates to outline the differences between stolon and rhizomes. It was poorly answered with responses such as stolon develop into roots while rhizomes develop into shoot. The candidates failed to outline the differences in relation to position of the stems, below or above ground, and the differences in their growing behaviour. Centres are advised to cover the differences between the two in detail.

(iii) The item was poorly answered by most candidates. The candidates outlined steps in propagating cuttings and gave responses such as selecting a branch of 30 cm with 3 buds, put in container with standard soil mix, cover with soil, press the soil to remove air pockets. The expected responses were correct planting time; sterilising of tools when making cuttings; proper/sterilised propagating media; use pests/diseases free cuttings; ensured planted cuttings are placed in a cool/shaded place; application of rooting powder/hormone; removed excess leaves.

3 **(a)** **(i)** The item was poorly answered by most candidates giving responses such as winter and summer. The expected responses were early spring/ spring/ late winter.

(ii) The item was fairly done. Candidates were required to outline ways which can reduce transplanting shoch in fruit trees. The candidates gave responses such as hardening off, do not injure plant root, remove the seedling with a ball of moist soil around the root ball, press the soil around the seedling.

(iii) The item was poorly answered. It required candidates to deduce how the soil pH of 3.0 will affect successful growth of fruit trees. Candidates gave responses such as low levels of calcium / phosphorus / macro nutrients without outlining how this will affect growth. The expected response was reduced growth due to increase in toxic elements / aluminium / manganese / minor elements; reduced growth due to calcium / magnesium/ phosphorus/ molybdenum deficiency; decrease in water use by plants; essential nutrients are leached beyond root zones; essential elements are locked in soil particles; inhibit useful microbial activity.

(b) (i) The item was well done by most candidates giving the correct response which was tropical.

(ii) The item was fairly done. Most candidates gave the correct response for part A which is a sucker and lost a mark for part B giving responses such as cutting, buds, leave. The expected response for part B was stem segment.

(iii) The item was poorly answered by most candidates. They gave responses such as washing hands when handling cuttings, use of sterile tools when cutting, selecting a branch with nodes, planting the cuttings. The expected responses were soak in water/ stand the cut end in water; cover them with clear plastic/ place the cutting in a clear plastic bag with a damp paper towel / cover the cuttings with moist soil before planting; reduce the number of leaves/prune; store out of direct sun; store bagged cutting in the refrigerator if the plant is frost-tolerant; use of misting / use of a mist propagating system.

(c) (i) The item was well done by most candidates giving correct responses such as shovel used for digging the soil.

(ii) The item was fairly answered. It required candidates to explain how land clearing will benefit the growth of fruit trees. Most candidates gave correct response for a factor and could not get the other part of the answer correct. The expected response was reduced incidences of pests / diseases attack; improving fruit tree growth; reduced competition for nutrients /sunlight/ water/ space; improving fruit tree growth.

(iii) The item was fairly done. Some candidates could not interpret data on plant height in relation to hole depth therefore giving incorrect response for recommended depth. The expected response was 60 cm.

(iv) The item required candidates to suggest steps that should be correctly done when preparing a home for the planting of fruit trees other than correct depth. It was fairly done with correct responses such as mark the hole diameter twice the size of a root ball; digging out the topsoil and put it aside; digging out sub-soil and put it aside; put back the topsoil; mix subsoil with compost manure; put back compost and subsoil; forking the bottom of the planting hole.

4 (a) (i) The item was fairly done. Some candidates gave incorrect responses such as pruning and shaping. The expected response was topiary.

(ii) The item was well done. Most candidates noted that there is promotion of renewed growth. Other notable responses were it allows air/sunlight penetration; reduce canopy weight;

decorates/beautify the plant; gives plant a definite/desire shape; provides a focal point/feature in landscape; used as a feature / component of a formal garden.

(iii) The item was poorly answered. Candidates made incorrect computations dividing the area by amount of water and used wrong units such as m instead of m^2. Given the size of land and the amount of water candidates were required to calculate the spray rate.

Answer: $0.15\,l/m^2$

(b) (i) The item was poorly done with most candidates giving responses such as fertilise the soil. A few candidates gave correct responses such as good at holding in nutrients; low pH helpful for acid-loving herbaceous plants; maintains its shape/ does not swell/collapse/compact when watered; well aerated/drained; good water/moisture retention.

(ii) The item was fairly answered. Some candidates were giving incorrect response for fertility, writing urea and fertiliser instead of a specific name of fertiliser. Most candidates were aware that for porosity – sand/river sand; perlite; organic matter; leaf mould while for fertility - compost/chicken manure/ kraal manure/ organic manure; wood ash; superphosphate could be used.

(iii) The item was poorly done. Candidates gave responses such as pot A has sterilised soil mix and loam-based compost. The expected responses were sand improves drainage or aeration of the soil; loam soil increases soil fertility; compost increases water retention; sterilised soil is free from diseases or pests.

(c) (i) The item was poorly answered. The candidates gave responses such as colour, size, quality. The expected responses were maturity / timing; weather; equipment / tools to be used; storage facilities; pickers; packing; transport; irrigation / watering plants before marketing; ensuring they are from pests and diseases.

(ii) The item was well answered by most candidates giving expected responses such as create customer awareness; informs customers about function of the product; informs customers where product can be bought; informs customers about product price; to persuade consumers to buy; to show case one's product superiority over the ones in the market; to remind consumers of product availability; ref. to increase sales/demand.

(iii) The item was poorly done. Most candidates could only give correct response on calculating the area, others committing to wrong units and wrong conversion of hectares to m^2.

Answer: $400\,kg/ha$

5 (a) (i) The item was poorly done. Candidates gave responses such as profit and loss account, sales account, assets and liability. The expected responses were cost of material; labour cost; equipment cost

(ii) The item was fairly done. Candidates gave incomplete responses such as plants beautify or act as windbreaks. The expected responses were plants add beauty to an area through greenery /colourful flowers; plants act as windbreaks hence reducing erosion; lawn provides

ground cover therefore preventing erosion; trees provide habitat for animals like birds/ lizards / snakes; increase biodiversity through insects / animals.

(iii) The item was poorly done. Candidates were giving responses such as it will reduce the beauty of the landscape under impact. The expected response for impact was broken wooden benches pose a safety risk hence needs to be replaced/repaired.

(b) (i) The question was well done. Candidates recalled mowing as their response.

(ii) The question was well done. On the main candidates gave expected responses such as enhance the aesthetics/beauty; control pests/diseases; keep lawn clean/tidy/healthy; triggers uniformity/ consistency in colour; rejuvenates the lawn grasses/ increase grass blades.

(iii) The question was poorly done. Most candidates could only get a mark for naming the method. Most candidates named incorrect methods such as mechanical and hand picking. The expected responses were chemical / use of herbicides; use of selective herbicides or any correct named herbicide to kill broad leaved weeds to eliminate weeds without damaging grass roots or getting rid of deep-rooted weeds.

(c) (i) The question was well done. The candidates gave expected responses such as bricks; lawn grass; trees; concrete; flowers; wood.

(ii) The question was fairly done with some candidates outlining benefits of one material. The expected responses were lawn grass - reduces dust /erosion /mud, bricks- making wall/ to prevent entry of unauthorised people /animals; concrete- surfacing walkways/ to direct people's movement; tress- for windbreaking/decoration/ shade.

(iii) The question was poorly done. Candidates were committing to wrong units such as m instead of m^2. Candidates who scored marks was in calculating the area of paving block and area of land.

PAPER 2: PRACTICAL TEST

General Comments

This is a practical examination paper targets Assessment Objective 2 and Assessment Objective 3. In this paper, candidates are expected to make calculated observations on specimens provided, identify, and draw logical inferences that relate to the displayed specimens. The paper allows the candidates to make an informed connection between displayed specimens especially regarding displayed diseases and displayed chemicals that can control them, displayed nutrient deficiency symptoms and displayed fertilisers that can control them.

The paper also allows candidates to demonstrate their ability to manipulate data and to arrive at critical decisions based on the data provided. The paper evaluates the ability of the candidates to apply the knowledge and skills they have acquired in the Horticulture syllabus to ensure a successful growth of plants or running of a horticultural enterprise. The Paper consists of two questions, the first question focuses on the specimens provided as per stipulated in the instruction to centres while the second one focuses on data manipulation based on an insert provided.

The overall performance of candidates on this component was good where all the questions were attempted fairly, and the candidates satisfactorily demonstrated skills in plant protections as well as in data manipulation.

Comments on Individual Questions

1 (a) (i) Display 1. Candidates lost marks as they were unable to name the class of the disease that caused symptoms on the diseased parts of plants on the specimen. They wrote the pathogen (causative agent) as opposed to naming the class of disease. It should be noted that the accurate knowledge of diseases symptoms is important in the selection for selection of the correct disease class on the displayed plant part specimens. Majority of the candidates were unable to give the specific name of diseases displayed on the plant part specimens but instead gave any disease in each individual class, yet the question / item needs the specific disease on specimens displayed.

(ii) Candidates lost marks as they failed to suggest the type of mouth parts of a pest that can transmit disease in Specimen C on display 1 in 1(a)(i) (viral disease). This has led to the majority of them loosing marks, but candidates did very well in naming an example of a pest that can transmit the disease in 1(a)(i) (viral disease).

(iii) Display 2: Most of the candidates were able to correctly select the appropriate chemical on display 2 to control diseases on display 1 specimens A, B and C. However, most of the candidates lost marks as they were using brand names/trade names of chemicals on display 2 in their responses rather than the chemical name or letter assigned to chemical labels R, S and T on display 2.

(**b) (i)** Display 3: Candidates demonstrated vast knowledge of the deficient elements/ nutrients on plant leave specimens E, F, G and H on display 3 but majority were unable to describe the observable features on the displayed specimens on display 3 instead they described general deficiency symptoms as a result, they lost marks.

(ii) Display 4: Candidates were required to observe fertiliser specimens 1, 2, 3 and 4 and suggest the appropriate fertiliser to use to correct symptoms on specimens E, F, G and H on display 3. The candidates lost marks as majority of them used a brand name/ trade name instead of the fertiliser name or numbers assigned to the specimens on display 4.

(iii) This question was a poorly performed by majority of the candidates as they failed to deduce the appropriate timing for application of fertiliser that corrects deficiencies in specimens E and F on display 3. The candidates lost marks as they were either naming season (spring), time of the day that is morning or afternoon or weather condition that is, cool or cloudy day rather than top-dressing / before planting and or basal dressing / after planting / post emergence.

2 **(a)** Most of the candidates did well in this question. Those who did not do well in this part, wrote a correct tools / equipment / implements needed to carry out the activity but failed to write correct description of the activity done and reasons why it is done leading to loss of marks.

(b) This question was well done by most candidates. However, some candidates lost marks as they could not correctly compute total expenses and the profit/loss.

PAPER 3: PROVIDER BASED ASSESSMENT

General Comments

This was the third group of candidates to be assessed under the new Horticulture syllabus. The component has four sections; Farm Diary, Field Observation Reports, Field Practical Training (FPT) and Practical Tasks of which three were subjected to external moderation. The three components which were externally moderated were Farm Diary, Field Practical Training and Field Observation Reports. The Practical Tasks were not externally moderated. All required deliverables were received.

The performance of the 2024 cohort was better than the performance of the 2023 cohort. Generally, all candidates satisfied the requirements needed for assessment and there was evidence of standardisation at the Centre. Almost all candidates did well in all the components except for Field Observation Report where majority of the candidates were slightly above average in terms of performance.

Farm Diary: All candidates typed their Farm Diaries, and they were presentable. Almost all candidates did well on this component. The enterprise selected by all candidates was on Vegetable production (Potatoes).

Field Practical Training (FPT): All reports were typed as per syllabus recommendation. The binding of projects was satisfactory. The needed attachments were provided by all candidates. The range of marks indicates that candidates took their Field Practical Training seriously i.e. both on the field and during compilation of the report.

Field Observation Reports: The common topic was: 'Comparison on the yield of tomatoes grown in a tunnel and in an open area'. General presentation of the candidates' work: all reports were typed. The binding of projects was satisfactory. The marks obtained by candidates indicate that most of them were of average performance.

Practical Tasks: The assessment for this component was not subjected to external moderation. All required documents were submitted except evidence of practical tasks carried out at the Centre. (videos, photos etc.). Practical tasks were assessed accordingly by the Centre.

Comments on Individual Tasks

1.0 Farm Diary

1.1 Cover Page

The cover page has to have the name of the production enterprise, the name of candidate, name of Centre, Candidate number and starting and completion date of the enterprise. This were all well done by the candidates.

1.2 Enterprise Details

The details considered three areas namely variety grown, age and population. The variety grown was done well by all candidates. Age was also well done even though there were some candidates who stated that the maturity age was 3 - 4 months. Population was well done by all candidates with most of them scoring the mark. Some candidates just wrote numbers without quantifying them, e.g. 33 instead of 33 potato tubers/ plants / crops.

1.3 Sequence of Activities

The activities carried out in correct order of sequence, and they were well done as the main activities / operations were outlined clearly and logically. The dates reflected for every activity.

1.4 Activities / Operations

There were many activities which exceeded the ten (10) required by the criteria. Relevant activities reflected in the diary are worth three (3) marks and they were well done by all candidates.

1.5 Tools Used

The tools used for every operation had to be reflected which was well done. The tools had to be appropriate for each activity for the candidate to get all the marks which was also well done by the candidates.

1.6 Importance of Activity

The candidates were expected to provide details about the significance of carrying out each operation which was worth ten marks. Generally, the candidates did very well as they were able to score a mark for each of the ten activities required.

1.7 Relevance of Comments

Comments made by the candidates should be relevant to the activity for them to score the three marks. The section was fairly done as some comments were not clearly spelt out.

1.8 Precautions Observed

This was fairly done by the candidates. The candidates were to observe all the safety precautions for the activities for them to score the three (3) marks. Most candidates managed to have more than one precaution. However, some precautions were general e.g. candidates will just write ‘protective clothing was put on’, without being specific as to what harm were they preventing themselves from. Cleaning of tools after use was well done as it was attempted by most candidates. Safe storage of equipment after use was well done.

1.9 Project Termination

Most candidates did well as they had a description of how the project was ended. The majority of the candidates scored four marks for having a description of how the products and residues were disposed. Observations about project viability were fairly done, as reasons why the project was viable were not advanced by some candidates.

1.10 Neatness of Work

Well done by all candidates as they presented work that was very neat thus scoring all the 3 marks.

2.0 Field Practical Training Report (FPT)

2.1 Cover Page

All candidates provided the expected details. Name of place of attachment was well done; all learners attracted maximum points allocated for the cover page.

2.2 Title Page

This component was well done, candidates managed to provide all expected criteria.

2.3 Contents Page

All candidates outlined the main headings in correct order. Very few candidates omitted a content, 'samples of farm records' under subheading but the attachments were available inside the project.

2.4 Declaration of Originality

The section was well done with only one candidate failing to indicate the dates showing period of the FPT.

2.5 Acknowledgements

This section was well done by all candidates.

2.6 Introduction

Name of place of attachment was well done. Justification of selection of place of attachment was clearly spelt out by all candidates. Most candidates stated their expectations before going for attachment, only a few stated what they experienced or learnt at the place of attachment. Clarity of the FPT of benefits from attachments was not clearly written. (Most learners stated what they benefited after FPT instead of how they think they will benefit).

2.7 Description of Farm Routine Schedule

All candidates drew the organogram well. The staff complement qualifications was well done. Tools and equipment used was well done. The daily work schedule of the farm was properly done. Workplace interaction description was clear for some candidates in terms of who reports to whom and the organogram was used in some cases to establish the line of communication. Farm records kept and their use-fairly done as some candidates stated how the farm records were kept but failed to state their usefulness to the farm. Technology leverages-fairly done, candidates failed to state how the farm takes advantage of computers/ technologies in the farm used for keeping records. Candidates managed to outline how a product is prepared for the market and stated the profitability of the farm.

2.8 Description of Activities Carried Out

Well done by all candidates and managed to show operations using pictures which is a good initiative.

2.9 Findings / Observations

List of expectations was well done and their benefits. 'Learning experiences not met' was addressed well by all candidates but 'closing of gaps' was not addressed adequately. Some learners showed that they closed the gap during FPT. Most candidates identified 'unexpected learning experiences gained' and managed to deduce how the experiences will be useful to them.

2.10 Conclusion

The worth of the attachment exercise was highlighted by all candidates. The lessons learnt were stated by candidates, but few failed to relate how the experience will make them better producers. Candidates did not state what can be done as to improve their learning experiences. The candidates were expected to state how the learning experiences could be made better which most candidates did well. There were a few candidates who did not make an attempt.

2.11 Recommendations

The candidates should cover areas of improvement on the farm, farm practices to be maintained and farm practices to be discouraged. The candidates did well in all the three sections covering all the three in their reports.

2.12 Rating by Training Officer in the Industry(TOI)

It was well done by all candidates.

2.13 Overall Report Quality

Candidates showed creativity as all of them had boarder lines, pictures and tables were evident in almost all candidates' work and some presented organograms. Most candidates attempted to use their ICT skills like spread of text, bolding, underlining, punctuations and spacing when compiling their report. There was clarity of illustrations used and sequencing. The quality of reports was pleasing since all reports were easy to flip, durable and pages were secure.

2.14 Appendices

All required attachments were availed. All candidates presented pictures of the farm and equipment and farm operations.

3.0 Field Observations Report

3.1 Title of Investigation

Candidates wrote titles which were not short and descriptive. The candidates displayed the factor to be investigated reflected on title. All candidates failed to bring in the element of comparison thereby losing a mark for that aspect. The parameters to be measured were not clearly spelt out as candidates wrote that they measured the yield instead of mass because the yield is calculated. The work of the candidates was neatly presented on the main (no dirt / cancellations / overwriting / stains / grease).

3.2 List of Equipment / Materials Used for Observations

Most candidates failed to get maximum marks for list of all materials/equipment used as they provided lists that were incomplete.

3.3 Objectives / Aims of Investigation

Generally, the objectives were relevant to title (crop/animal, parameter & treatment), achievable (is it possible), measurable (specific parameter) and specific (comparison, spec. parameter, crop).

3.4 Statement of Factor to be Observed

Most candidates managed to identify the problem. The candidates did well in outlining possible causes of factor / problem investigated and possible solutions to factor / problem investigated. However, the candidates were limited in providing two benefits of the proposed solution. There were no benefits reflected by most candidates.

3.5 Factor to Compare and Contrast in the Observation / Factor Manipulated

The statement of factor (parameter) to be observed was well done by almost all candidates. State factors of comparison / manipulation (treatments) were also well done. Candidates failed to show how factors to be manipulated are introduced.

3.6 Number of Units per Observation / Manipulation

This part of the report was poorly by the candidates. The candidates were supposed to state the number of replications / plots per treatment which they failed to do. The candidates also failed to justify their choices on the number of replications / no replications. The Centre is advised to provide guidance to the candidates so that they can provide all the necessary information when doing their reports.

3.7 Layout / Sketch Plan of Investigation

This section requires candidates to have a sketch plan with a title, treatments, appropriate dimensions, labelling and neatness. The candidates did well in most of the aspects except for showing appropriate dimensions where most candidates did not fully label their sketch plans. In addition, the labelling of the layout was not fully done by candidates. The sketches were neat (no dirt / stains / grease / cancellations).

3.8 Approach / Procedure

The candidates were to provide a step-by-step account of what is to be done (pre, conduct, post treatment including equipment and materials) which is worth 4 marks. Most candidates failed to outline steps taken clearly under procedure. The steps were however numbered in correct sequence. The procedure that was written by some candidates could not be followed easily. Candidates failed to reach minimum number of activities required.

3.9 Information Collected from Observation / Data

The candidates were to state clearly what to be observed, units of measure which many were fell short of as they could not relate mass and yield. They stated that they observed yield, but yield is calculated and not collected. The candidates had a good understanding of the instruments, devices used for collecting data, their specifications. They also presented that data perfectly.

3.10 Analysis of Findings / Implications of Findings

Computations of results was not done. Some candidates did not indicate the units of measurements. The overview of the results was satisfactory even though some candidates failed to adequately show the trends, e.g. highest result obtained and the concluding statement. Selecting statistical parameter for summarising the data was poorly done as candidates failed to calculate yield as per the objective. However, the candidates mentioned the form of data as expected. Nonetheless, the presentation method was relevant for the presentation. The title of the presentation for some candidates was not striking e.g. underlined, bolded or use of upper-case letters. Overview interpretation of the findings was poorly done as candidates referred to yield as mass.

3.11 Conclusion

Some candidates failed to repeat the purpose of the investigation. They also fell short in explaining the differences observed. Another area where candidates failed was in providing the answer to the observed factor. This was mainly due to candidates confusing mass with yield. The explanation of unexpected outcomes was well done as most candidates managed to indicate their new experiences. Similarly, most candidates indicated the main lesson or lessons learnt from the investigations.

3.12 Recommendations

Candidates managed to recommend the appropriate practice to be adopted for increased production. In addition, the actions suggested were relevant to the findings. In spite of this, the suggested modifications of investigation to ensure accurate results were not correctly done as candidates failed to state how they can change the investigation methodology in order to get accurate results. Most recommendations were aligned to objectives as stated at the beginning of the study.

3.13 Precautions / SHE During Observations

Majority of candidates failed to state threats posed by the study to the environment, their health and safety. Nonetheless, the candidates were able to reflect on accurate adherence to Safety, Health and Environment

concerns though they just generally wrote ‘putting on of protective clothing’ instead of stating the type of protective wear and its intended purpose e.g. ‘face mask to prevent inhalation of chemicals’. In terms of suggesting intelligible mitigation to SHE threats almost all candidates failed to make the suggestions.

3.14 Alignment of Observations to Existing Literature

All candidates failed to relate their investigation to any correct literature or correctly format their work correctly as per the literature used.

4.0 Practical Task Test

The submitted Practical Tasks were from all the five modules as per the expectations of the Teaching Syllabus and different performance criteria that included:

Module 1 Grow plants

(i) (PC 1.2.3) – identify internal parts of a flower

(ii) (PC 1.1.4) – record keeping in Horticulture

(iii) (PC 1.3.3) – sexual propagation of crops by use of seeds

(iv) (PC 1.3.3) – asexual propagation of crops by use of cuttings

Module 2 Produce vegetable crops

(i) (PC 2.1.2) – set out the land to prescribed size

(ii) (PC 2.4.7) – identify weeds affecting vegetable crops

(iii) (PC 2.5.3) – harvest vegetable crops using appropriate methods

(iv) (PC 2.6.1) – carry out marketing vegetable products using appropriate tools with consideration to SHE.

Module 3 Produce fruit trees

(i) (PC 3.4.2) – apply appropriate mulching material

(ii) (PC 3.4.4) – apply fertilisers appropriately to enrich the soil

(iii) (PC 3.4.6) – perform training of fruit trees

(iv) (PC 3.5.13) – demonstrate calibration of a sprayer

Module 4 Ornamentals

(i) (PC 4.1.4) – carry out preparations for planting ornamental plants

(ii) (PC 4.1.7) – plant seeds and/or seedlings of ornamental plants

(iii) (PC 4.2.9) – keep records employing ICT skills

(iv) (PC 4.5.1) – apply appropriate management practices of lawn

Module 5 Landscape design

(i) (PC 5.1.7) – develop an inventory of a site

(ii) (PC 5.1.10) – measure to layout the site

(iii) (PC 5.1.11) – install landscape materials

(iv) (PC 5.2.1) – carry out relevant maintenance activities