

CROP HUSBANDARY AND HORTICULTURE 2

1. GENERAL COMMENTS

The standard of the questions compares well with the previous year's paper. However, generally, candidates performed below expectation.

2. SUMMARY OF CANDIDATES' STRENGTHS

The Chief Examiner commended candidates for orderly presentation and clarity of expressions.

Most of the candidates exhibited adequate knowledge in the following areas:

- Explaining the principles of crop rotation
- Advantages of crop rotation
- Benefits of weeding
- Effects of over application of fertilizers in crop production
- Effects of excessive irrigation in crop production
- Climatic and soil requirements of cashew crop production
- Ways by which sunlight and wind affect crop production

3. SUMMARY OF CANDIDATES' WEAKNESSES

Candidates had challenges in answering questions from the following areas:

- Features of corn smut
- Describing various methods of layering and stating factors that affect layering
- Differentiating between pathogenic and non-pathogenic diseases of plants
- Steps in performing "T" shield budding in citrus plants
- Procedure in sowing tomato seeds and transplanting of tomato seedlings
- Ways by which biotic factors affect the growth and development of horticultural crops
- Effects of moisture stress in crop production
- Benefits of topping as a cultural practice
- Causes of mechanical damage to crops

4. SUGGESTED REMEDIES

The Chief Examiner made the following suggestions meant to remedy the weaknesses of candidates:

- Teachers should engage technicians and resource persons to take candidates through procedures such as layering, budding, grafting, rooting of cuttings and germination of special seeds
- Teachers should make effort to adequately cover the topics in the syllabus
- Candidates should read through examination questions carefully to understand the demands before attempting them

5. DETAILED COMMENTS

Question 1

- (a) **Explain three principles of crop rotation.**
- (b) **State four advantages of crop rotation.**
- (c) **State:**
 - (i) **three distinguishing features of corn smut disease.**
 - (ii) **three ways of controlling corn and smut disease.**
- (d) **State four problems associated with the use of cow dung as manure on the farm.**

1 (a) This is a question that many candidates were able to state the principles but failed to explain them thereby losing marks. Others however, appeared to have no knowledge of it

The expected answers were;

Principles of crop rotation

- leguminous crops should be included in the rotation to fix atmospheric nitrogen into the soil. They can also be ploughed into the soil while blooming to serve as green manure
- soil exhausting crops / heavy feeders should follow light feeders since different crops require different amount and type of nutrients
- shallow rooted crops should follow deep rooted crops. The roots of different crops grow to different depth and take nutrients from different levels in the soil
- crops from the same family which are likely to be attacked by the same pests or diseases should not follow each other
- a short fallow period must be included in the rotation to allow for the restoration of soil fertility

1 (b) Many candidates who attempted this question managed to answer it but concentrated their responses on disease control, pest control, weed control, soil fertility conservation out of a number of available answers.

The expected answers were;

Advantages of crop rotation

- disease cycles are disrupted / destroyed
- pest cycles are disrupted / destroyed
- it is possible to crop on a piece of land for a long period
- plant nutrients in the soil are evenly used as crops with different root systems follow each other / balances soil nutrients / maintains soil nutrients
- soil fertility is maintained / conserved
- the frequency of labour need is reduced as the land is not cleared frequently
- it prevents total crop failure
- it suppresses weeds
- it maximizes the use of land
- maintains desirable pH range

1 (c) This question presented a great challenge to many of the candidates. Candidates failed to give features of the diseases but somehow were able to state the control measures of the diseases.

The expected answers were;

(i) Features of corn smut

- large galls develop resulting in tumour-like growth
- are seen as whitish galls
- galls contain masses of dark sooty spores
- galls are formed on the ears, tassel, stalk, nodal shoots, and mid-rib of leaves
- it gives the corn ear a burned scorched appearance
- it results in stunted growth of the plant

(ii) Control of corn smut

- plant resistant varieties
- plant early
- use clean planting materials
- treat seeds with appropriate fungicide
- By practising crop rotation
- Remove and burn infected plants before smut galls burst to release spores

(d) Majority of the candidates were able to answer this question. However, candidates lacked knowledge of the dangers it poses to the environment by releasing methane as a green gas that negatively affect / harms the environment.

The expected answers were;

Problems associated with the use of cow dung as manure

- some of the seeds of grasses remain unharmed during digestion and sprout to spread in the environment
- it contaminates water / river bodies / ground water and the soil ecosystem
- through its use cow dung as a manure can spread human pathogens to crop produce / it can contaminate crop produce
- cow dung as a manure releases methane into the atmosphere to increase greenhouse effect i.e. depletion of the ozone layer
- It is bulky in nature and therefore expensive to transport / difficult to handle

Question 2

(a) (i) **Describe four methods of layering.**

(ii) **State four factors that could affect the success of layering.**

(b) **Outline four ways of caring for plants during the rooting process.**

(c) **State two effects of low temperature on the growth and development of vegetables.**

(d) **Differentiate between pathogenic and non-pathogenic diseases of plants.**

- 2 (a) (i) Many candidates who attempted this question failed to provide adequate answers to score full marks. This showed that, candidates lacked adequate knowledge and understanding of the topic. Some candidates confused layering with budding and grafting.

The expected answers were;

Description of methods of layering

Tip layering

- the growing tip of the plant is bent and dipped into the rooting medium
- this is done for trailing types of plants
- after rooting, the daughter plant is severed from the parent plant for planting

Simple layering

- branches / shoots are bent to touch the rooting medium
- the point which is inserted into the medium is bruised/wounded/cut to enhance rooting
- this type of layering is used for low flexible stems and dangling types of growth habits of plants
- after rooting the daughter plant is severed

Compound / Serpentine layering

- multiple points on a branch / shoot are bent to touch the rooting medium
- these points are bruised / wounded / cut before they are inserted into the medium to enhance rooting
- after rooting, the stem is cut into pieces such that each cutting would have rooted portion for planting
- this method is suitable for plants with flexible stems

Mound / stool layering

- stems are cut back during dormant period
- the cut stems are allowed to sprout and mounds heaped on them
- this induces rooting of the etiolating shoots
- after some time the mound is broken and the stem point with root is cut and used for planting
- this method is suitable for shrubs

Trench layering

- a trench is dug
- a tall stem is bent horizontally into the trench
- it is covered and only the tip is left above the ground
- the plant stem develops roots
- after sometime it is removed, cut and planted out
- this method is suitable for flexible stems

Air layering / gottee / marcotting / circumposition

- remove a ring of bark of about 2cm from a selected branch
- this is done just below a node of a branch of about 1.0cm to 1.5cm in diameter
- a ball of damp / moist soil / rooting medium is wrapped around the cut/wounded portion in the air to induce rooting
- the branch with the rooted portion is cut / severed from the parent plant for planting
- this method is suitable for propagation of woody shrubs creepers and trees

2 (a) (ii) Candidates failed to recognise the role of rooting hormone in layering. They also included fertilizer application which was dangerous to a developing tender root of layered portion. On the average however, their performance for the question was encouraging.

The expected answers were;

Factors affecting success of layering

- accumulation of organic material (like carbohydrates and auxins) in the wounded / cut portion
- application of rooting hormones at the wounded / cut portion
- continuous supply of water to the parent plant
- continuous moistening of rooting medium
- good aeration of rooting medium
- moderate temperature in the rooting medium

(b) Many candidates gave encouraging responses to this question

The expected answers were;

Ways of caring for plants during rooting process

- regular water supply / watering the crop
- disease control
- pest control
- maintaining humid environment
- maintaining optimal temperature
- regular weed control

(c) This was a question that was easy to score all maximum marks but some candidates failed to take advantage of it.

The expected answers were;

Effects of low temperature on the growth and development of vegetables

- results in poor plant growth
- slows down photosynthesis
- results in low crop yield

- affects flowering / fruiting and bulb formation of crops such as tomato, cabbage and onion
- delays germination of seeds
- low soil temperature impedes nutrient/mineral uptake resulting in poor growth

(d) Majority of the candidates were not able to give the expected answers to this question.

The expected answers were;

Differences between pathogenic and non-pathogenic plant diseases

- pathogenic diseases are diseases caused by biological organisms such as fungi, bacteria, viruses, nematodes and phytoplasmas while non-pathogenic diseases result from non-biological sources such as nutrient deficiencies, adverse weather conditions and environmental pollutants / hormonal / genetic changes

Question 3

- (a) **Outline the stages of the life cycle of the maize weevil.**
- (b) **Outline the steps in performing a T shield budding of citrus seedlings.**
- (c) **Explain two effects each of the following conditions in crop production.**
 - (i) **excessive application of chemical fertilizer;**
 - (ii) **excessive irrigation.**

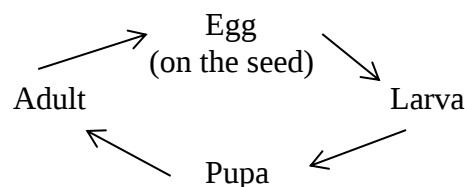
(a) This was a simple question that candidates could have answered easily to score all marks. However, they left out arrows to connect the stages to indicate direction of development of the weevil.

The expected answer was

Life cycle of a maize weevil

Egg (on the seed) → larva → pupa → adult

OR



- (a) The question was difficult for the candidates which showed that the 'T' shield budding method was not popular among candidates. Candidates failed to recognise that a bud is taken from budwood of a desired variety and confused budwood with rootstock.

The expected answers were;

Steps in performing a 'T' shield budding

- make a longitudinal cut of about 2.5cm in the root stock at a point at least 30cm above the soil level
- follow with a horizontal cut at the upper part of the cut
- use the knife to make a slight twist to open the two flaps of the bark
- remove the bud from the bud wood by cutting about 1.2cm below the bud
- make another horizontal cut of about 1.3cm above the bud to remove the bud
- remove carefully the wood behind the bud
- insert the bud piece under the bark flap of the stock until the horizontal cuts on the shield and the stock are in contact
- keep the bud in position with budding tape
- in 21 days after the bud has taken (healed), the top of the stock is cut just above the bud

(b) (i) Candidates managed to state the effects of over application of chemical fertilizers on crops but could not explain

The expected answers were;

Effects of over application of chemical fertilizers on crop production

- plants suffer from fertilizer burn / chemical burn, leaves of plants turn yellow and brown which eventually wilt and die
- soil becomes acidic, nutrients in the soil may not be available to crops
- it leads to increased air pollution, greenhouse gases (such as carbon dioxide and nitrous oxide) are released into the atmosphere
- it will increase cost of production since fertilizers cost money to procure

(c) (ii) Many candidates did well in answering this question but a few could not explain the effects of excessive irrigation.

The expected answers were;

Effects of excessive irrigation on crop production

- causes waterlogged conditions, the soil may be poorly drained
- useful soil microorganisms (such as bacteria that change organic matter into humus) may not get air and warm temperature to function
- seeds fail to germinate due to poor aeration
- certain useful chemical reactions cannot take place hence nutrients are not released to plants
- plants develop poor/deformed roots causing plants to grow stunted, weak and susceptible to diseases and adverse conditions
- it causes leaching of nutrients beyond the reach of plant roots
- it will increase the cost of crop production since it costs money to pump water to the field
- it will disrupt soil structure leading to soil erosion

Question 4

- (a) State four ways by which biotic factors affect the growth and development of horticultural crops.**
- (b) State four effects of moisture stress in crop production.**
- (c) Discuss the procedure in raising tomato seedlings under the following headings:**
 - (i) seed sowing;**
 - (ii) transplanting.**
- (d) Explain three objectives of tillage in vegetable production.**

(a) This question had good responses from the candidates but some candidates confused biotic factors with abiotic factors.

The expected answers were

Ways by which biotic factors affect growth and development of horticultural crops

- Weeds compete with horticultural crops for nutrients, water, space and light
- Weeds seeds contaminate horticultural crop produce
- Some animals feed on horticultural crop produce thereby destroying them
- Some organisms parasite on horticultural crop
- Some organisms cause diseases to horticultural crops
- Some organisms live in symbiotic relationship with horticultural crops
- They help in dispersal of seeds
- They aid in pollination of crops flowers for increased production
- They help in soil formation
- Some beneficial bacteria can fix nitrogen in the soil in support of plant growth
- They help to aerate the soil, improve soil structure and water infiltration and percolation to promote plant growth

(a) Candidates handled this question very well except a few who mixed up the procedure

The expected answers were;

Effects of moisture stress on crop production

- plants lose their turgidity
- the rate of photosynthesis decreases leading to reduced leaf area
- maturity of plants delays
- plants show signs of wilting in the afternoon (quality of crops reduce)
- leaves become pale and dry
- leaf abscission takes place
- it hinders seed germination
- it hinders root development
- it inhibits synthesis and transportation of growth regulators
- crop produce loose water, become wrinkled thereby reducing quality
- soil dry up, preventing release of nutrients for plant uptake and reducing yield

- (b) (i) Candidates handled this question very well except a few who mixed up the procedure and failed to score the marks.

The expected answers were;

Procedures in sowing tomato seeds

- fill seed box / seedbed with soil and compost
- broadcast the seed evenly over the soil / drill seeds on the seed box / seedbed
- cover the seeds thinly / lightly with soil
- water covered seeds lightly

- (b) (ii) Candidates had problem providing sequential procedure for transplanting and failed to score the marks.

The expected answers were;

Procedures in transplanting tomato seedlings

- harden seedlings by reducing shading progressively
- withdraw watering with progressive wider intervals
- transplant when the first four leaves appear or when 15cm to 25cm tall / when 4 to 6 weeks old
- transplanting should take place in the morning or on cool cloudy day or late in the evening
- water the seedbed well before uprooting the seedlings
- carefully dig deep into the soil with minimal damage to the roots and bring out the seedlings and loosen roots gently using appropriate tools
- in the field, dig a hole at the appropriate depth
- plant the seedlings deep with only the topmost leaves above ground
- water well after transplanting (water copiously)

- (c) Majority of the candidates stated the objectives alright but failed to explain them.

The expected answers were;

Explanation of objectives of tillage in vegetable production

- it controls weeds to reduce competition for space, light and nutrients
- increases soil aeration to enhance root development and increase nutrient absorption
- increases soil water infiltration to enhance nutrient availability
- promotes development of bulbs, tubers and corms to increase yield
- exposes soil borne pests to sunlight / buries them to control pests and diseases
- it loosens the soil for better root penetration and development

Question 5

- (a) State three benefits each of the following cultural practices:
- (i) topping;
 - (ii) weeding.
- (b) Outline the steps involved in the processing of coconut fruits into oil.
- (c) Describe the process by which each of the following pineapples are prepared for planting:
- (i) crown;
 - (ii) slip;
 - (iii) sucker.

(a) (i) Many candidates misconstrued the term topping as earthing up and therefore gave the benefits of earthing up for topping.

The expected answers were;

(a) Benefits of topping

- Controls plant height for easy harvesting
- Increases yield
- It makes plants to assume spreading canopy

(a) (ii) This was a question that many candidates were able to answer properly.

The expected answers were;

Benefits of weeding

- Controls diseases
- Eliminates pests and their hiding places
- Prevents competition for nutrients, water, spaces and light
- Prevents contamination of crop produce
- Prevents strangulation of crops
- It allows for free movement of air on the farm
- Removes allelopathic effect
- Helps to maintain soil nutrient balance
- Weeding help plants growth

(b) Many candidates fell short of securing maximum marks allotted to the question. In presenting the procedure candidates failed to state the removal of husk, drying of kernel, grating and extraction of oil by cold pressing.

The expected answers were;

Steps involved in the processing of coconut fruit into oil

- remove husk
- split nut / fruit open
- drain water
- dry and remove kernel/endosperm
- grate the copra
- extract oil from the cake / press grated copra to extract oil

- (c) Candidates in answering this question gave irrelevant responses. Most failed to state that, propagules are detached from parent plant, trimmed and dried which will score them full marks.

The expected answers were;

Preparation of pineapple propagules for planting

(i) Crown

- cut the crown of pineapple about half an inch (2.5cm) below the leaves
- trim to see root buds
- dry for about a week before planting
- dip the bottom in a suitable fungicide before planting

(ii) Slip

- pluck or remove the slip from the mother plant
- strip off the lower leaves of slips
- dry in the sun or in partial shade for 3 to 4 days
- dip planting material in suitable fungicide before planting

(iii) Sucker

- Remove sucker from the parent plant
- strip off the lower leaves of suckers
- dry in the sun or in partial shade for 3 to 4 days
- dip planting material in suitable fungicide before planting
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Question 6

(a) State three:

- (i) climatic requirements;**
 - (ii) soil requirements;**
- for the production of cashew.**

(b) State four types of damage caused by aphids to crops.

(c) Enumerate four causes of mechanical damage to horticultural farm produce.

(d) Explain three ways by which each of the following factors affects crop production.

- (i) sunlight;**
- (ii) wind.**

- (a) (i) Candidates in answering this question provided annual rainfall figure and temperature ranges but failed to mention humidity, sunlight and altitude.

The expected answers were;

Climatic requirements for cashew production

- annual rainfall between 750mm – 1300mm

- temperature should range between 15°C – 33°C
- requires moderate humidity
- adequate sunlight
- altitude ranges from 0 – 2000 m above sea level

(a) (ii) Many candidates who answered this question excluded depth of soil from their answers

The expected answers were

Soil requirements for cashew production

- it grows well on red sandy loam soil / laterite soil
- it requires well drained soil
- it requires deep soil
- suitable soil pH required is 5.5 to 6.5

(b) This question appeared to be difficult for majority of the candidates. Damages caused by insects with chewing mouthparts were mentioned by candidates. That is, aphids were mistaken for chewing insects.

The expected answers were;

Damages caused by aphids on crops

- leaves of affected plants curl inwards
- produces sweet honeydew that attracts ants and causes the growth of fungus on plant surfaces (sooty mould)
- leaves of affected plants become brown and drop
- fruits of affected plants decay
- affected plants grow stunted inhibiting terminal leaf shoots
- they suck the sap of young succulent green leaves and pods

(c) Many candidates misunderstood this question as damages caused by tractors and bulldozers. The answers therefore did not meet those expected from the marking scheme. Candidates therefore, performed poorly.

The expected answers were;

Causes of mechanical damage to horticultural farm produce

- Over packing
- Wobbling of produce during transportation
- Use of inappropriate tools and technique of harvesting
- Throwing/dropping produce into containers/farm containers
- Use of wooden containers with sharp/rough edges
- Packing produce in vehicles not properly designed to carry produce
- Poor road network

(d) This question was properly answered by many candidates who attempted it. Candidates on average scored high marks for the question.

The expected answers were;

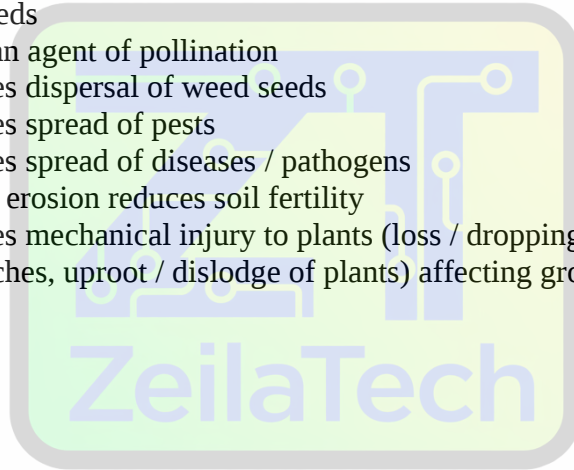
Ways by which sunlight and wind affect crop production

(i) Sunlight:

- light intensity influences the rate of photosynthesis
- light intensity influences the growth rate of young plants
- affects the elongation of stem and expansion of leaves
- affects the formation of flowers, fruits and seeds
- controls fruit maturity and ripening
- affects crop yield
- influences etiolation in plant growth
- it affects transpiration in plants
- it affects evaporation of soil water leading of soils
- it assists in hardening seedlings in the nursery

(ii) Wind:

- increases evapotranspiration rate (causing high water loss/wilting in plants)
- causes rapid drying of seedbed resulting in poor and irregular germination of seeds
- it is an agent of pollination
- causes dispersal of weed seeds
- causes spread of pests
- causes spread of diseases / pathogens
- wind erosion reduces soil fertility
- causes mechanical injury to plants (loss / dropping of leaves, breaking of branches, uproot / dislodge of plants) affecting growth and yield



Smart Learning Tools

CROP HUSBANDRY AND HORTICULTURE 3

1. GENERAL COMMENTS

The standard of the paper compared favourably with that of previous years. Candidates' performance was not encouraging. The paper exposed the candidates' lack of knowledge and understanding of the technical nature of the subject.

2. SUMMARY OF CANDIDATES' STRENGTHS

The Chief Examiner commended candidates for the correct use of terminologies, orderly presentation and clarity of expressions.

Most of the candidates exhibited adequate knowledge in the following areas:

- Naming class of crop to which specimen A / ginger belongs;
- Naming varieties of specimen A / ginger;
- Stating uses of specimen A / ginger;
- Cultural methods of controlling specimen B / spear grass;
- Naming the type of irrigation that make use of specimen C / sprinkler head;
- Stating ways of maintaining C / sprinkler head;
- Naming the type of storage organ of specimen D / cassava stick;
- Naming the method of propagation of specimen D / cassava stick;
- Naming observable parts of specimen D / cassava stick;
- Stating observable features of specimen E/ farmyard manure;
- Advantages of using specimen E / farmyard manure;
- Stating uses of F / black nursery polybag;
- Stating observable features of G / pride of Barbados;
- Naming disease of specimen H / yam.

3. SUMMARY OF CANDIDATES' WEAKNESSES

Candidates had challenges in answering questions from the following areas:

- Stating features of specimen B / spear grass;
- Stating the economic importance of specimen B / spear grass;
- Naming parts of specimen C / sprinkler head;
- Disadvantages of using specimen D / cassava stick as propagating material;
- Stating the advantages of using specimen F / black nursery polybag;
- Characteristics of the group of ornamental plants to which specimen G / pride of Barbados belongs.

4. SUGGESTED REMEDIES

The Chief Examiner made the following suggestions meant to remedy the weaknesses of candidates:

- Teachers should make every effort to teach practical lessons;
- Teachers should give adequate exercise to candidates to practice;
- Candidates should read through examination questions carefully to understand the demands before attempting them.

5. DETAILED COMMENTS

Question 1

- (a) (i) Name the class of crops from which specimen A was obtained.
- (ii) Name two varieties of specimen A.
- (iii) State four uses of specimen A.
- (a) (i) State four features of specimen B that enable it to survive in the environment.
- (ii) State two cultural methods of controlling specimen B.
- (iii) State two economic importance of specimen B.

1. (a) (i) This question was generally well answered. It was on class of crop of specimen A / ginger.

The expected answer was;

Class of crop of specimen A (Ginger)

- spice crop

(ii) Almost all the candidates were able to name two varieties of specimen A / ginger

The expected answers were;

Varieties of specimen A (Ginger)

- yellow Jamaica
- Sierra Leonean selection
- off white
- white/pale colour ginger
- yellow ginger
- butterfly lily ginger
- globba ginger
- hidden ginger
- local ginger
- bitter ginger
- shell ginger

(iii) The uses of specimen A / ginger was correctly stated by candidates.

The expected answers were;

Uses of specimen A (Ginger)

- for food
- as a spice
- production of confectionary
- medicinal
- production of drinks
- as insect repellent
- made into solution to kill insects on farms e.g. grasshopper

1 (b) (i) A few candidates were able to answer this question by stating features of specimen B / spear grass which make them survive in the environment.

The expected answers were;

Features that make specimen B (spear grass) to survive in the environment

- produces many seeds / has high reproductive capacity / capability
- seeds are easily dispersed (by wind)
- grows very fast
- endures harsh / unfavourable / severe environmental conditions
- has competitive / aggressive growth habit
- persistent/resistant to control / eradicate
- has extensive root system / stolons

(b) (ii) Candidates were able to state cultural practices as follows;

Cultural methods of controlling specimen B (spear grass)

- crop rotation
- flooding
- weeding
- burning
- mulching

(b) (iii) Some of the candidates were not able to state the economic importance of specimen B / spear grass.

The expected answers were;

Economic importance of specimen B (spear grass)

- serves as fodder for animals
- used as roofing material
- causes damage to root and tuber crops
- causes injury to farm animals and humans
- serves as medicine

Question 2

- (a) (i) Name the type of irrigation that involves the use of specimen C.
- (ii) Name three parts of specimen C.
- (iii) State two ways of maintaining C.
- (b) (i) Name the method of propagation associated with specimen D.
- (ii) State four disadvantages of using specimen D as a propagating material.
- (iii) Name the type of storage organ produced by specimen D.
- (iv) State the major nutrient contained in the storage organ produced by specimen D.
- (v) Name two observable parts of specimen D.

(i) Candidates could easily name the type of irrigation that involves the use of specimen C / sprinkler head.

The expected answer was;

Type of irrigation that uses specimen C (sprinkler head)

- sprinkler irrigation / sprinkler / sprinkler system

(a) (ii) Candidates found it difficult to name parts of specimen C / sprinkler head

The expected answers were;

Parts of specimen C (sprinkler head)

- nozzle
- control screw
- cap
- riser
- inlet
- seal
- pipes and valves

(a) (iii) Majority of the candidates were able to state ways of maintaining specimen C / sprinkler head.

The expected answers were;

Ways of maintaining specimen C (sprinkler head)

- clean after use / dismantle and clean
- store in a cool dry place
- remove blockages from inlet and outlet/nozzle
- tighten loose screw
- replace damaged parts
- oil / grease metal parts

(a) (i) Almost all candidates answered the method of propagation of specimen D / cassava stick correctly.

The expected answer was;

Method of propagation of specimen D (cassava stick)

- Vegetative/asexual

(b) (ii) Candidates had difficulty giving the disadvantages of using specimen D / cassava stick as propagating material.

The expected answers were;

Disadvantages of using specimen D (cassava stick) as a propagating material

- it is bulky/difficult to transport
- cannot be stored for long period of time
- it spreads viral diseases easily
- new varieties cannot be obtained
- it is difficult to acquire for large scale farming
- sometimes it is expensive to acquire

- (b) (iii) Almost all the candidates were able to state the storage organ produced by specimen D / cassava stick.

The expected answer was;

Type of storage organ produced by specimen D (cassava stick)

- root tuber / tuber

- (b) (iv) The major nutrient contained in specimen D / cassava stick was correctly stated by almost all the candidates.

The expected answer was;

Major nutrient contained in the storage organ of specimen D (cassava stick)

- carbohydrate

- (b) (v) Candidates were able to name observable parts of specimen D / cassava stick.

The answer is as follows;

Observable parts of specimen D (cassava stick)

- node
- internode
- bud
- scar left by older leaves

Question 3

- (a) (i) Name three major plant nutrients contained in specimen E.
- (ii) State two advantages of using specimen E in crop production.
- (iii) State three observable features of specimen E.
- (a) (i) State the uses of specimen F in crop production.
- (ii) State three advantages of using specimen F.
- (iii) Name three other materials that could be used in place of specimen F to achieve the same purpose.

- (a) (i) This question was well answered by candidates.
The expected answers were;

Major plant nutrients in specimen E (farmyard manure)

- nitrogen
- phosphorus
- potassium
- Sulphur
- Calcium

(ii) Candidates were able to state the observable features of specimen E / farmyard manure

The expected answers were;

Advantages of the use of specimen E (farmyard manure)

- releases nutrients slowly/over a long period of time
- improves soil structure
- it is environmentally friendly / biodegradable
- source of food for soil organisms/microorganisms
- improves cation exchange capacity of the soil
- last longer in the soil
- conserves soil water / high water holding capacity
- cheap to acquire / less expensive

(iii) Candidates answered this question very well.

The expected answers were;

Observable features of specimen E (farmyard manure)

- uneven particle size
- brown/black colour / dark
- contain animal parts / hairs / furs / feathers / plant materials
- unpleasant odour / smell

(b) (i) A few candidates provided correct answers to this question.

The expected answers were;

Use of specimen F (black nursery polybag)

- Sowing/nursing seeds
- Raising young plants / seedlings

(ii) Many candidates could not give the expected answers to score.

The expected answers were;

Advantages of specimen F (black nursery polybag)

- light in weight/easy to carry
- less expensive
- not easily breakable
- prevents algae development/growth
- has high moisture retention ability / capacity

(iii) This question was very well answered by candidates.

The expected answers were;

Other containers that could be used in place of specimen F (black nursery polybag)

- seed box
- seed tray
- clay pot
- concrete pot
- metal pot
- bamboo pot
- calabash
- plastic water bottles / plastic containers

Question 4

(a) (i) Name the group of ornamental plants to which specimen G belongs based on its use.

(ii) State three observable features of specimen G.

(iii) State four characteristics of the group of ornamental plants to which specimen G belongs.

(a) (i) State four cultural practices that are carried out in the production of the crop from which specimen H was obtained.

(ii) Name three diseases of the crop from which specimen H was obtained.

(a) (i) Majority of the candidates were able to answer this question without any problems.

The expected answer was;

Group of ornamental plants to which specimen G (pride of Barbados) belongs

- hedging plants

(ii) Candidates answered the questions well.

The expected answers were;

Observable features of specimen G (pride of Barbados)

- brightly coloured flowers
- compound leaves
- thorny stem
- bowl shaped flowers

(iii) This question was poorly answered by almost all the candidates.

The expected answers were;

Characteristics of hedging plants

- can tolerate regular pruning
- branch rapidly/profusely
- easily propagated by seeds/cuttings
- withstands drought conditions

(b) (i) Majority of the candidates answered this question very well.

The expected answers were;

Cultural practices in the production of specimen H (yam)

- capping
- staking
- weed control
- fertilizer application
- earthing up
- disease control
- vine training / training
- pest control

(ii) Almost all the candidates could name disease of specimen H / yam.

The expected answers were;

Diseases of the crop of specimen H (yam)

- witches broom
- mosaic disease / yam mosaic virus
- anthracnose
- root knot disease
- tarspot disease
- tuber rot
- leaf blight
- leaf spot
- collar rot

