

GENERAL AGRICULTURE 2

1. GENERAL COMMENTS

The standard of the paper compared favourably with that of previous years with respect to content, syllabus coverage and level of difficulty.

The performance of candidates was generally better than the previous year.

2. SUMMARY OF CANDIDATES' STRENGTHS

- (1) Candidates have adequate knowledge on the advantages for using inorganic fertilizers in crop production.
- (2) They have good knowledge on soil water conservation.
- (3) Candidates also had good knowledge of the contribution of cover crops to soil and water conservation.
- (4) They have very good knowledge of marketing functions of agribusiness.
- (5) candidates also showed good knowledge of animal husbandry practices such as dehorning and culling.

3. SUMMARY OF CANDIDATES' WEAKNESSES

- (1) Candidates still could not spell correctly technical words, scientific terms and names of crops.
- (2) Majority of the candidates could not explain the chemical weathering process of hydrolysis, oxidation and solution hence could not explain how water causes weathering in rocks.
- (3) They could not give reasons why farm holdings are generally small in West Africa.
- (4) Candidates could not come out with disadvantages of farm mechanization.
- (5) They had little information about the aims of animal improvement in West Africa.
- (6) Some candidates failed to read the questions well. Thus, some gave more points than was required. This was a waste of time for both candidates and examiners.
- (7) Some answers could not be recognized quickly because of poor English expressions. This is not an English paper, but marks can only be awarded when the point is made right.

4. SUGGESTED REMEDIES

- (1) Tutors should teach the scientific terms and names properly.
- (2) There should also be proper teaching of the chemical processes of weathering.
- (3) Tutors should highlight topics identified as candidates' weaknesses.

5. DETAILED COMMENTS

QUESTION 1

- (a) (i) Give three reasons why disc ploughs are frequently used on soils in West Africa.
- (ii) State four effects of the frequent use of the disc plough on soils.
- (b) (i) Explain the term irrigation.
- (ii) State four disadvantages of overhead irrigation.

(a) (i) Generally, only a few candidates attempted this sub question and they scored low marks.

Majority of the candidates could not give reasons why disc ploughs are frequently used in tropical soils, an indication that the candidates did not know the robust nature of the disc plough.

Expected Response

Reasons why disc ploughs are frequently used on soils in West Africa

- its rolling action permits work on lands with stones
- allows work on soils with stumps
- permits work on lands with slippery/clayey/heavy soils
- it partially turns over soil slices, so grass turfs left help to minimize soil erosion
- tropical soils are usually shallow and therefore it helps to improve soil depth for crop root penetration

- (ii) Most of the candidates answered this sub question quite well. They were able to state the effect of frequent use of the disc plough on soils as demanded by the sub question.

Expected Response

Effects of frequent use of disc plough on soils

- soil pulverization / destruction of soil structure
- soil compaction / formation of hard pan
- poor drainage / poor water percolation
- high water loss from soil surface/evaporation
- causes soil erosion

- (b) Majority of the candidates did not find it difficult in explaining the terms 'irrigation' and stating the disadvantages of overhead irrigation.

Expected Response

(i) **Explanation of the term Irrigation**

It is the process of artificially applying water to the soil for crop use.

(ii) **Disadvantages of overhead irrigation**

- expensive in terms of equipment
- heavy droplets damage delicate growing crop
- may damage soil structure
- not efficient in windy areas
- requires high amount of power
- needs a stable water supply for most economical use of equipment
- water must be clean, free of sand and debris
- large amount of water dissolve salts
- leads to spread of diseases
- requires technical know-how/skill to operate

QUESTION 2

(a) **State:**

(i) **two advantages;**

(ii) **four disadvantages;**

of the communal land tenure system.

(b) **Give three reasons why farm holdings are generally small in West Africa.**

(c) **State four disadvantages of farm mechanization.**

Majority of the candidates attempted this question. In part (a), most of the candidates were able to state the advantages and disadvantages of the communal land tenure system.

In part (b), candidates performed poorly generally in giving reasons why farm holdings are small in West Africa. Candidates were baffled by the word 'holdings' as used in the question. In part (c), most candidates lost marks because they were not able to state the advantages of farm mechanization correctly. They limited their answers to only the effect on the soil.

(a) **Expected Response**

(i) **Advantages of communal land tenure system**

- every member of the community has a right to the land
- government can acquire land easily for public use
- cooperative farming is possible
- land acquisition is sometimes at no cost to community members

- (ii) Disadvantages of communal land tenure system
- land cannot be used as collateral for loans
 - non-community members do not easily have access to land
 - each member is only allocated a small piece of land
 - litigation on land / problem with sharing of land
 - excessive land segmentation leads to uneconomic use of land
 - land fragmentation prevents mechanization
 - difficulty in cultivating permanent tree crops
 - individuals cannot sell land
 - large plots of land may be left undeveloped.
- (b) Reasons why farm holdings are generally small in West Africa
- unfavourable land tenure systems
 - inadequate capital
 - inadequate use of farm machinery and implement
 - inadequate processing facilities
 - poor rural infrastructure
 - poor marketing system
 - prevalence of pests
 - inadequate storage facilities
 - fear of failure due to high risk
 - prevalence of diseases
- (c) Disadvantages of farm mechanization
- creates unemployment /displaces human labour
 - may destroy soil structure
 - fumes from machinery pollutes the environment
 - expensive to practice
 - requires skilled labour to operate and maintain/unavailability of technological know-how

QUESTION 3

- (a) **What is inorganic fertilizer?**
- (b) **Give four advantages for using organic fertilizers in crop production.**
- (c) **State two ways in which cover crops contribute to soil and water conservation.**
- (d) **Describe four methods of applying inorganic fertilizers in crop production.**

Majority of the candidates attempted this question and generally performed well especially in sub question (a), (b) and (c). A few of the candidates had challenges in answering sub question (d) i. e. method of applying inorganic fertilizer and the spelling of technical terms.

Candidate should be made aware that 'Top dressing' is not a method of applying fertilizer. It is a way of applying fertilizer in two dosages and can be practiced using any of the methods of application.

Expected Responses

(a) Explanation of inorganic fertilizer

Any synthetic/manufactured chemical substance which releases nutrients for plant use.

(b) Advantages for using organic fertilizers in crop production

- releases nutrients gradually/add nutrients to soil
- contains both macronutrients and micronutrients
- stabilizes soil pH through its buffering effect
- regulates soil temperature
- provides feed for soil microbes
- reduces leaching of soil nutrients
- improves soil structure/binds soil particles
- improves water-holding capacity of soil
- checks soil erosion
- cost is relatively low

(c) Contribution of cover crops to soil and water conservation

- produce litter which decay to improve soil structure\bind soil particles
- decayed litter adds nutrients to soil
- reduce impact of rain drops on soil
- reduce the rate of evaporation of water from the soil/improve water-retention in soil
- reduce the speed of run-off water hence check erosion
- minimize the effect of wind on soil surface
- create suitable soil micro climate for soil organisms

(d) Methods of applying inorganic fertilizers

- broadcasting
- band / side placement / row placement/side dressing
- ring application
- foliar application / spraying
- fertigation
- drilling method

QUESTION 4

- (a) Enumerate four farming practices which could lead to soil and water loss.**
- (b) State three ways in which water causes weathering of rocks in West Africa.**
- (c) Discuss three factors that influence soil erosion.**

Only a few candidates attempted this question and had low marks. In (a), candidates were expected to enumerate farming practices that could lead to soil and water loss but some candidates rather mentioned drainage, rainfall and wind which are not farming practices. The expected responses are as follows:

- (a) Farming practices that could lead to soil and water loss
 - improper tillage practices eg ploughing along the slope
 - continuous cropping
 - overgrazing
 - continuous use of farm machinery e.g. ploughing
 - clean clearing of farm lands
 - bush burning
- (b) This part was also poorly answered by candidates. Knowledge on hydration, hydrolysis and solution could have helped the candidates score higher marks.

Expected Response

Ways in which water causes weathering of rocks

- force of rain droplets
 - glacier/moving water e.g., rivers
 - freezing of water in rock crevices
 - hydration- rigid attachment of water to rock minerals resulting in chemical alteration of mineral and separating from others.
 - solution – water dissolves soluble minerals and carries them off.
 - hydrolysis – reaction of water with rock mineral to form a new compound results in disintegration.
- (c) The few candidates that answered this sub question were able to state the factors that influence soil erosion but could not properly discuss the factors. Candidates were to mention both the positive and negative effects of the factors.

Expected Response

Factors influencing soil erosion

- Vegetation cover of the area
- Topography /slope of land
- Structure of the soil
- Amount/ intensity of rainfall/water
- Speed of wind/wind
- Human activities
- Organic matter content of soil
- Texture of soil

QUESTION 5

- (a) Describe five cultural methods of controlling crop pest.**
- (b) List four grasses that are used for lawn establishment in West Africa.**
- (c) Give one example of insect pests with the following mouth parts:**
 - (i) boring;**
 - (ii) piercing and sucking.**

- (a) Most of the candidates answered this sub question. A few of them answered it satisfactorily by describing the cultural methods of controlling crop pest while majority of them were describing general methods like chemical control and biological control.

Expected Response

Cultural methods of controlling crop pest

- Crop rotation
- Time of planting
- Time of harvesting
- Burning
- Good farm sanitation
- Flooding
- Tillage operations
- Use of pest-resistant varieties
- Weed control

- (b) A greater percentage of the candidates who answered this sub question were able to mention the appropriate grasses used for preparing lawns.

Expected Response

Examples of Grasses for lawn establishment

- Carpet grass / savanna grass
- love grass / Tafo grass/Tuttiri
- Japanese turf grass /Japanese cushion grass
- St. Augustine grass
- Bermuda grass / Bahama grass / Doob grass / Devil grass
- Paspalum
- Buffalo grass

(c) Candidates could mention insects with boring mouth parts and those with piercing and sucking mouth parts, but some candidates mention any pest they could remember.

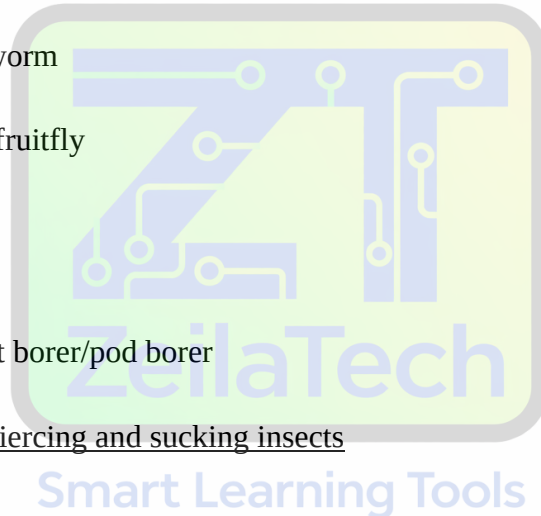
Expected Response

(i) Examples of Boring insects

- Leaf miner
- American bollworm
- Weevil
- Mediterranean fruitfly
- Mango fruitfly
- Budworm
- Thrips
- Beetles
- Stem borer/fruit borer/pod borer

(ii) Examples of Piercing and sucking insects

- Aphids
- Cotton stainers
- Leaf hoppers
- Mealy bugs
- Plant bugs
- Scale insects
- White flies
- Capsids/Mirids
- Fruit moths
- Cotton bollworms



QUESTION 6

- (a) (i) **What is grafting as used in crop propagation?**
(ii) **Explain four factors that influences graft success.**
(b) **State six measures that could be used to control insect-pests of stored grains.**

(a) Most of the candidates who attempted this question performed poorly. In an attempt to explain grafting, candidates had challenges with the correct spelling of the terms 'stock' and 'scion'. Most of the candidates also failed to state that the stock and the scion should come from the same species.

It is also important to mention that the parts to be joined should be two stems and not any other plant parts such as bud. This will differentiate grafting from budding.

Candidates were able to mention the factors that influence graft success but were not in a position to explain the factors and this contributed to the low marks for this question.

Expected response

- (i) Explanation of grafting as used in crop propagation

It is the union / joining of the cambium layers of two plant stems of the same species to grow as one plant

- (ii) Factors that influence graft success

- compatibility of scion and stock – same species
- skills and knowledge of the operator
- environmental factors eg temperature, humidity
- alignment of stock and scion
- disease infection
- diameter of stock and scion
- physiological stage/age of stock and scion

(b) Most of the candidates stated a few of the measures that is used to control insect pests of stored grains. Other candidates did not take note of the word 'insect' and gave answers for controlling other pest such as rodents and birds.

Expected Response

Measures to Control insect pest of stored grains

- use of concrete floors and rooms
- timely harvesting
- removal of infested grains before storage
- proper drying of grains before storage

- fumigation / cleaning of storage area before storage
- treat grains with appropriate insecticide before storage
- hermetic storage could be done/use of airtight bags
- stores should be well ventilated but water proof
- store should be inspected regularly to detect and control pest
- use of smoke in a local setting

QUESTION 7

(a) Explain each of the following terms as used in animal production:

- (i) flushing;**
- (ii) tethering;**
- (iii) weaning.**

(b) Give two reasons why maintenance ration is important in animal production.

(c) State three benefits of each of the following animal husbandry practices:

- (i) culling;**
- (ii) dehorning.**

(d) Mention two major sources of minerals in animal nutrition.

(a) This sub question was answered by most candidates and they scored almost all the marks. However, in the explanation of flushing, the emphasis on 'female animal' and 'before servicing' did not come out clearly.

Explanation of terms

(i) Flushing

It is the giving of female animals highly nutritious diet just before servicing to increase the level of fertility and chances of multiple births.

(ii) Tethering

Tying of animals by their neck / legs to stumps / trees / rocks with rope to restrict their movement.

(iii) Weaning

It is the process of separating young animals from their mothers and introducing them to solid feed.

(b) Most of the candidates who attempted this question could not give reasons why maintenance ration is important. The responses were on importance of farm animals, an indication that the candidates did not get the requirement of the question,

Expected Response

Importance of maintenance ration in animal production

- sustains basic physiological activities/meet basic nutritional requirements
- prevents malnutrition / ensures that animals develop properly
- maintain body weight of animal

(c) This part was well answered by the candidates who attempted it. Candidates were able to give the benefits of culling and dehorning as animal husbandry practices. This is an indication that the candidates had adequate knowledge in animal husbandry management practices.

Expected Response

(i) Benefits of culling in animal husbandry

- reduces the spread of diseases among animal
- reduces overcrowding
- helps get rid of unproductive/ sick animals
- reduces cost of feeding
- isolate for treatment

(ii) Benefits of dehorning in animal husbandry

- animals are less dangerous to handle
- reduces injury caused by the animal to other animals/minimizes fighting
- transporting animal is easier
- makes more space available in kraal / pen
- animals are not entangled when feeding on natural pasture
- reduces damage to hide of animals
- reduces injury caused by animal to farmer

(d) Candidates could not come out with sources of minerals in animal nutrition. They could only mention bone meals as the source of mineral in animal nutrition.

Expected Response

Major sources of mineral in animal nutrition

- blood meal
- bone meal
- calcium phosphate
- granulated oyster shell / egg shell
- salt lick
- common salt

QUESTION 8

- (a) State three aims of animal improvement programmes in West Africa.**
- (b) State four characteristics of the deep litter system of poultry keeping.**
- (c) (i) What is fish farming?**
 - (ii) List three structures that are used for growing fish in West Africa.**
 - (iii) List four methods of preserving fish in West Africa.**

- (a) Animal improvement is aimed at altering the traits of the farm animal to alter its economic importance.

Candidates were rather mentioning the importance of animal production.

Expected Response

Aims of animal improvement in West Africa

- increase quantity of animal product e.g. meat, milk, egg
- increase quality of animal product eg. carcass, meat
- enhance growth rate of animals
- increase resistance to diseases
- increase resistance to pests
- promote adaptability to local environment
- produce animals with high feed conversion efficiency

- (b) In this part, candidates were to state the characteristics of the deep litter system of poultry keeping but candidates rather stated the advantages of that system, an indication that the question was not well understood.

Expected Response

Characteristics of the deep litter system of poultry keeping

- birds are confined in well ventilated house
- house has concrete floor
- floor is covered with litter
- provision of foot bath at the point of entry
- long wall of building facing east-west direction
- provision of feeding and watering troughs

- (c) Candidates did not have difficulty in answering the question. They could define fish farming, mention structures for growing fish and stated some methods of fish preservation.

Expected Response**(i) Meaning of fish farming**

The controlled rearing of fish in water.

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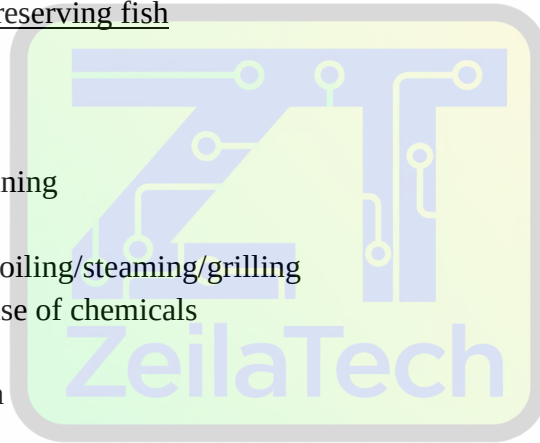
The practice of rearing fish in a confined water body

(ii) Structures used for growing fish

- earthen ponds
- cages
- concrete tanks/tanks
- raceways
- fish pens
- aquarium

(iii) Methods of preserving fish

- smoking
- drying
- canning
- salting/brining
- freezing
- cooking/boiling/steaming/grilling
- pickling/use of chemicals
- frying
- irradiation

**QUESTION 9**

Smart Learning Tools

(a) (i) What is agribusiness?

(ii) Outline the steps involved in setting up an agribusiness.

(b) Enumerate four marketing functions in agribusiness.**(c) Outline two roles of universities in agricultural extension**

- (a) Candidates could define agribusiness but the aspect of 'profit making' did not come out clearly. Candidates did not understand the demand of (a) ii. They rather mention factors to consider when setting up a business such as Land and Capital instead of the steps in setting up an agribusiness.

Expected Response**(i) Meaning of Agribusiness**

It is a profit-making enterprise that trades in agricultural products or services.

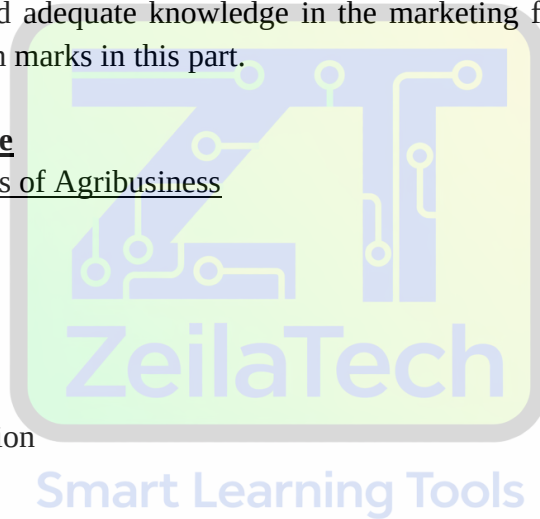
(ii) Steps involved in setting up an Agribusiness

- Market survey
- Choice of agribusiness type/decision-making
- Selection of business location
- Sourcing for initial investment capital
- Registration of Business
- Opening of Bank accounts
- Acquiring the needed resources
- Commencing the business

(b) Candidates had adequate knowledge in the marketing function in agribusiness and they score high marks in this part.

Expected Response**Marketing functions of Agribusiness**

- Assembling
- Sorting
- Grading
- Processing
- Storage
- Transportation
- Financing
- Distribution
- Packaging
- Advertising



(c) Some candidates could only state the general roles played by universities such as research.

Expected Response**Role of Universities in Agricultural extension**

- train Extension Agents
- make available research findings to Extension Agents
- develop and introduce better agricultural practices
- design and develop farm tools and implement
- organize training / workshops for farmers
- design and develop innovative ways of teaching farmers

QUESTION 10

- (a) Distinguish between short term credit and long-term credit in agricultural financing.
- (b) State two demerits of each of the following sources of agricultural credits.
- (i) individuals;
 - (ii) cooperatives;
 - (iii) government;
 - (iv) money lenders.
- (c) State four characteristics of an effective extension system.

- (a) Generally, all the candidates who attempted this sub question performed below expectation. Those who attempted this question could not differentiate between 'long term credit' and 'short term credit'

Expected Response

Difference between *short term credits* and *long-term credits*

Short term credits have repayable periods usually less than 2 years while long term credits are repayable usually within 6 – 35 years.

- (b) This question was not well understood by candidates. Candidates were to state the challenges one is likely to face when acquiring credit from such sources to fund his agricultural projects.

Expected Response

- (i) Demerits of Individuals sources of credit
- not always available
 - not very reliable / amount needed may not be granted
 - untimely demand for repayment
 - high interest rate
- (ii) Demerits of Cooperatives sources of credit
- loans not given on time
 - do not always have money for members
 - poor credit management
 - too much bureaucracy
- (iii) Demerits of Government sources of credit
- high level of bureaucracy
 - collateral may be needed depending on the amount

- loan not given on time
- too rigid and does not take the requirement of the individual into consideration
- often governed by political consideration rather than economic considerations

(iv) Demerits of Money lenders sources of credit

- high interest rates
- not always reliable
- untimely demand for repayment
- not always available

(c) Candidates who attempted this sub question confused the characteristics of an effective extension system with the characteristic of agricultural education such as 'learners are usually adult'. Candidates did not understand the requirement of this sub question.

Expected Response

Characteristics of an effective Extension System

- adequate financial support
- effective training of personnel
- effective linkages with researchers and farmers
- farmers involved in all phases of Extension programmes
- good salary and incentives for personnel
- good transportation system
- strong administrative support
- monitoring and evaluation
- good communication among stakeholders

Smart Learning Tools

GENERAL AGRICULTURE 3

1. GENERAL COMMENTS

The standard of the paper compared favourably with that of previous years with respect to content, syllabus coverage and level of difficulty.

The performance of candidates was better this year than the previous year.

2. SUMMARY OF CANDIDATES' STRENGTHS

The Chief Examiner commended candidates for the following features noticed in their scripts:

- (1) Knowledge of maintenance of knapsack sprayer as a simple farm tool.
- (2) Names of farm animals from which gizzard could be found.
- (3) Correct identification of garden eggs, gizzard pepper etc.
- (4) Candidates could mention pests and diseases of garden eggs.
- (5) Knowledge of cause of soil acidity.
- (6) Knowledge of local methods of preserving pepper such as curing and drying.

3. SUMMARY OF CANDIDATES' WEAKNESSES

The following weaknesses were noticed in the scripts of candidates:

- (1) Poor construction of sentences that made it extremely difficult for examiners to comprehend.
- (2) Inability to mention the effect of soil acidity on crop production.
- (3) Inability to outline steps involved in carrying out experiment to determine soil acidity.
- (4) Wrong spellings of technical terms and scientific names.
- (5) Could not prepare the profit and loss account very well.

4. SUGGESTED REMEDIES

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

- (1) Teachers should periodically use question and answer to drill students on scientific words and technical terms
- (2) Teachers should give exercises involving preparation of profit and loss account
- (3) Teachers should organize more practical lessons involving identification of specimens

5. DETAILED COMMENTS

QUESTION 1

- (a) (i) Give the family name of specimen A.
(ii) Name three varieties of the crop from which specimen A was obtained.
- (b) Name three pests and two diseases that attack the crop from which specimen A was obtained.
- (c) Mention three uses of preserving specimen B.
- (d) State three ways of preserving specimen B.

- (a) (i) The candidates could mention the family name, however, a few of them had problems with the correct spelling.

Expected Response

Family name of Specimen A (Garden egg)

- Solanaceae

- (ii) Few candidates were only familiar with Antropo, Obolo black beauty and Aubergine

Expected Response

Varieties of Specimen A (Garden egg)

- Turkey berry
- Thai egg plant
- Aubergine
- White / White beauty / Long white / Round white egg plant
- Casper egg plant
- Fairytail egg plant
- Indian egg plant
- Black beauty egg plant
- Diamond egg plant
- Japanese egg plant
- Purple / Long purple egg plant
- Antropo
- Obolo

- (b) (i) The common pest that candidates were familiar with were grasshoppers, whiteflies and nematodes.

Expected Response

Pest of Specimen A (Garden eggs)

- Bollworm / *Heliothis* spp.
- Grasshopper / *Zonocerus* spp.
- Epilachna beetle / *Epilachna* spp.
- Cutworm / *Spodoptera* spp.
- whiteflies
- aphids
- leafhoppers
- crickets
- plant / leaf bugs
- nematodes
- moths / caterpillar
- Red spider mite / mites
- *Urentius* spp.
- *Selepa docilis*
- Rodents

- (b) (ii) The common examples of diseases of garden eggs cited by candidates included mosaic, fruit rot and leaf curl.

Expected Response

Diseases of Specimen A (Garden egg)

- | | |
|-----------------|-------------------|
| - Fruit rot | - Anthracnose |
| - root rot | - Bacteria canker |
| - Fusarium wilt | - Bacteria wilt |
| - Leaf curl | - Damping off |
| - root knot | - Collar rot |
| - Early blight | - Millet rust |
| - Mosaic | - Powdery mildew |
| - Rust | |

Sub questions 1 (c) and (d) were answered very well by the candidates who attempted them.

(c) Expected Response

Uses of Specimen B (Hot pepper fruit)

- preparing drinks
- preparing food / garnishing
- flavouring / seasoning of food/spice

- medicine / medicinal purpose

(d) **Expected Response**

Preservation of Specimen B (Pepper)

- curing
- drying
- refrigeration / freezing
- canning
- pickling

QUESTION 2

(a) **Mention two nutrients that a lamb obtains from drinking specimen C.**

(b) **Name three animals from which specimen C could be obtained.**

(c) **List three products that could be obtained from the processing of specimen C.**

(d) (i) **Mention the function of specimen D in farm animals.**

(ii) **State three characteristic features of specimen D that enable it to perform efficiently the function mentioned in (d)(i).**

(iii) **Name three farm animals from which specimen D could be obtained.**

(a) Candidates could mention the nutrients obtained from fresh milk in general, however, they could not mention the specific vitamins such as vitamin D, B2. and B12

Expected Response

Nutrients in Specimen C (Fresh milk)

- fat
- protein
- water
- calcium
- potassium
- vitamin D
- vitamin B2 / Riboflavin
- vitamin B12
- carbohydrate / lactose

Sub questions (b), (c) and (d) were answered well by all the candidates who attempted it. In (c), the candidates were able to mention only cheese, and ice cream and not the others. A few candidates also had challenges with (d) ii, the characteristics of the gizzard.

(b) **Expected Response**

Animals from which specimen C (milk) could be obtained

- | | |
|-------------------|-----------------|
| - Ewe/sheep | - camel |
| - Cow/cattle | - donkey |
| - Nanny goat/goat | - horse |
| - Sow/pig | - water buffalo |
| - Reindeer | - Yak |

(c) **Expected Response**

Products that could be obtained from processing Specimen C (milk)

- casein
- Butter
- Ice cream / cream
- Cheese
- Confectioneries
- Yoghurt
- Whey
- Body cream
- Skim / skimmed milk
- Powdered milk

(d) (i) **Expected Response**

Function of Specimen D (Gizzard)

- grinding of feed
- churning of feed

(ii) **Expected Response**

Characteristics of Specimen D (Gizzard)

- Thick muscular wall
- Contain small stones / pebbles/ grits
- Rough inner surface / Tough corrugated membrane

(iii) **Expected Response**

Farm animals from which specimen D (Gizzard) could be obtained

- Domestic fowl/ chicken
- Turkey
- Guinea fowl
- Quail
- Duck
- Ostrich
- Goose
- Dove

QUESTION 3

- (a) Outline the steps involved in using specimen E in the control of pest on the farm.**
- (b) State five precautions that should be taken when using specimen E to control pest on the farm.**
- (c) Mention five farm maintenance practices that could be carried out on specimen E.**

(a) Candidates could mention the steps involved in the use of knapsack sprayer but a few of them missed the sequence.

Expected Response

Steps when using Specimen E (Manual Knapsack sprayer)

- fill knapsack sprayer with spray liquid
- tighten the lid
- put knapsack sprayer of your back / mount sprayer
- build pressure in tank by lifting pump lever up and down
- direct nozzle to the crop to be sprayed
- open valve to control amount of chemical to be dispensed at a time
- if pressure is lost, build it up by lifting pump lever up and down

(b) Candidates only focused on the protective items like goggles, boots, gloves. The other precautionary measures such as do not eat or drink when spraying, were not mentioned.

Expected Response

Precautions when using specimen E (Knapsack sprayer)

- wear rubber gloves
- wear protective dresses e.g. long sleeves, long trousers
- wear goggles
- wear rubber boots
- do not spray when it's about to rain
- ensure lid is well tightened / tank is well covered
- spray when it is not windy early morning or late evening
- spray along the direction of the wind
- do not eat when using Specimen E
- do not drink when using Specimen E

(c) Candidates are familiar with maintenance of most farm tools and equipment, and they applied the principle in this sub-question.

Expected Response

Maintenance of Specimen E (Knapsack sprayer)

- depressurize when not in use
- lubricate moving metal parts
- wash tank immediately after use
- replace defective parts e.g. nozzles cracked hose
- tighten loose parts
- store in cool dry place

QUESTION 4

- (a) Using the water, test tube and the litmus papers provided, determine whether specimen F is acidic or basic.
- (b) Outline the steps involved in performing the experiment in (a).
- (c) State four possible causes of the result obtained in (a).
- (d) Mention three effects of the result of the experiment on specimen F in (a) on crop production.
- (e) Name one crop that is likely to grow well on specimen F.

(a) Expected Response

Soil Reaction of Specimen F (Soil sample)

- Specimen F is acidic
- (b) Candidates had difficulty in outlining the steps involved in the experiment to determine soil acidity. The challenge was with the sequence in the steps.

Expected Response

Steps in determining whether soil is acidic or basic

- fill the test tube with some of the soil sample
 - add enough water to the soil sample in the test tube
 - shake / stir the content of the test tube thoroughly
 - allow content to settle
 - dip a blue / red litmus paper into the content of the test tube
 - observe the colour change if any
 - interpret the colour change to determine if soil is acidic or basic
- (c) In this sub question, candidates could only mention leaching and addition of nitrogen fertilizers as the only causes of soil acidity

Expected Response

Causes of soil acidity

- leaching of bases
- addition of nitrogen fertilizers
- acid rain
- nutrients up take / cation absorption
- water logging
- presence of sulphur / oxidation of sulphur in the soil
- respiration of soil organisms / accumulation of CO₂ in soil

(d) The candidates who attempted the question on the effect of soil acidity on crop production had challenges getting the correct answers.

Expected Response

Effect of soil acidity on crop production

- affect the activities of bacteria that release nitrogen from organic matter
- faster leaching of plant nutrients
- Al, Fe, Zn, Mn toxicity
- deficiency / unavailability of P, Mo, Ca, Mg, K, N to crop
- deformation of crop roots
- affect the structure of soil especially clayey soil

(e) Candidates could only mention crops like maize, tomatoes and beans as those that grow well on acidic soils.

Expected Response

Examples of Crops that grow well on acidic soils

- bean e.g. cowpea, soya bean
- carrot
- cucumber
- maize
- garlic
- pepper
- radish
- tomato
- pumpkin