CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)

FORM FOUR PRE – NATIONAL EXAMINATION 2025
AGRICULTURE 1
MARKING SCHEME

SECTION A (16 MARKS)

1. Multiple-choice

I	ii	iii	iv	v	vi	vii	viii	ix	x
C	A	A	E	D	C	B	B	E	D

2. Matching items.

LIST A	i	ii	iii	Iv	v	vi
LIST B	E	H	A	G	D	L

SECTION B. (54 MARKS)

Answer ALL questions

3. Advantages

i) Generating more profit: GMOs is an effective way of providing farmers' profit. Besides high production, it reduces variable costs of production including weeding and application of inorganic fertilizers, pesticides and herbicides.

(ii) Promoting knowledge of genetic alterations: This is done through mapping genetic material for GM crops. Plants can be engineered to resist temperature or produce higher yields which are good for regions where the climate limits productivity.

(iii) High yield: The use of GMOs technology increases crop yields hence, decreases food prices and consequently enabling economically disadvantaged families to buy food for their everyday consumption, thus, it also prevents starvation.

(iv) Adding more nutritional values to crops: The GMO method adds nutritional value to crops that lack necessary vitamins and minerals. This helps malnourished populations to receive more nutrients from the diet.

Any three (03) points =(1.5marks @= 4.5 MARKS)

Disadvantages

(i) GMOs are believed to be dangerous to living organisms such as insects which depend on crops, because new crop genes can be deadly to them.

(ii) The process of making GMOs includes adding new genetic material into an organism's genome. Research on the effects of large-scale cultivation of GM crops has sparked various concerns specifically those ideas on ecosystems with GMO strains.

(iii) Genetically modified crops threaten the existence of indigenous species as they are likely to cross-breed each other.

(iv) GMO causes unwanted residual effects. A genetically modified plant can leave unwanted residual substances that can remain in the soil for extended period.

(v) The engineered crops can act as mediators in transferring genes to wild plants which can lead to the emergence of new weeds.

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Any three points (1.5marks @= 4.5 MARKS)

4.(a) Use of clean planting materials: Planting seeds or vegetative materials which are free from pests help in establishing pest free crops.

(b) Timely planting: This involves growing of crops early before pests build up. This enables the crop to escape pest infestation hence grow healthy. For example, maize planted early may escape stalk borer infestation.

(c) Proper seedbed preparation: This should be thorough and preferably cultivated in dry season. This will expose the pests, particularly which are soil borne such as white grubs, chafer grubs and nematodes.

(d) Trap cropping: This involves planting of border strips of a crop which attract pests thus diverting them from the main crop. For less attractive trap crops, it is advised to plant them before the main crop and for the most attractive trap crops, they can be planted along the main crop.

(e) Close season: This is the period when a susceptible crop is not grown in order to control a certain pest or group of pests. The principle of this method is that the pests will

(f) Crop rotation: Crops which are more susceptible to a particular pest are rotated with others which are not susceptible to it.

(g) Use of resistant crop varieties: Plant breeders have developed crop varieties which have natural protective mechanisms against pests attack. For example, the hairy cotton against jassid bug, goose necked sorghum against birds and highly tillering sorghum against shoot fly attack. There are some varieties of onions and lemons which produce substances that are repellent to pests.

(h) Observing field hygiene: This involves keeping the field free from any materials which harbor pests. It includes removal or burning of crop residues of previous seasons. This helps specially to control some pests which can harbour in crop residues, for example, bollworms in cotton and cereals.

(i) Destruction of alternative hosts: Some plants particularly weeds act as alternative hosts to crop pests. The removal of such weeds reduces pest infestation. A good example is mallow weed which harbours cotton stainers.

j) Alteration of environmental conditions: This involves the creation of certain micro-climates that are not conducive to some pests. For example, open pruning in coffee discourages antestia bugs while mulching reduces thrips.

(k) Proper spacing When crops are properly spaced it becomes difficult for pests to move from one plant to other. However, closer spacing in groundnuts discourages aphids.

(l) Observing proper crop nutrition: Application of fertilizers and manure help crops to grow strong and be able to withstand or escape pests' attacks.

(m) Timely harvesting: Harvesting crops at proper time prevents serious attacks by pests. For example, infestation of some pests such as grain weevils, rats and mice as well as brown scales is higher with late harvesting. Therefore, timely harvesting will enable crops to escape pest attacks.

Any nine points 1mark @ = 09 marks

5.a) Why farmers should practice sustainable agricultural production? Give five (5) points.

i. Protects the Environment

- Prevents soil degradation, erosion, and deforestation, Reduces pollution of water sourcesfrom chemicals
- Preserves biodiversity (beneficial insects, microbes, and native plants)

ii. Maintains Soil Fertility

- Practices like crop rotation, composting, and cover cropping replenish nutrients, Healthy soil leads to long-term productivity

iii. Saves Water and Resources

- Encourages efficient irrigation (e.g., drip irrigation)
- Reduces waste of fertilizers and pesticides by applying only what's needed

iv. Reduces Production Costs

- Less dependence on expensive inputs (chemicals, synthetic fertilizers), Uses local, natural resources (e.g., manure, compost)

v. Enhances Food Security

- Promotes consistent and reliable food production over time, also Diversified farming systems help reduce risk of total crop failure.

vi. Improves Farmers' Health

Reduces exposure to harmful agrochemicals, Encourages the use of organic and natural pest control methods

vii. Builds Resilience to Climate Change

- Sustainable practices help the land withstand droughts, floods, and temperature changes,
- Encourages the use of climate-smart crops and practices

viii. Meets Market and Consumer Demand

- Consumers are increasingly demanding safe, eco-friendly and ethically grown food Access to premium markets (e.g., organic or eco-labeled products)

ix. Supports Future Generations

- Keeps land productive for future farming, Ensures that resources like water, soil,

Any five (5) points (05 marks)

b) (i). Aggregates.

Uses: Making concrete (with cement and water), Plastering walls and floors, Drainage systems, Road construction andLaying foundation bases

(ii) Thatch Grasses

Uses: Roofing material (especially for huts and granaries), Insulation (keeps buildings cool), Fencing in traditional homesteads, Used in animal shelters or shade structures

(iii) Bricks

Uses: Building walls (houses, granaries, stores), Fencing and boundary walls Construction of fireplaces, kilns, and stoves, Laying floors or pavements (especially interlocking bricks)

(iv) Timber

- Uses: Roof structures (trusses, rafters, purlins), Doors, windows, and frames Furniture and fittings (tables, beds, shelves)
- Fencing posts or gates
- Scaffolding in construction
- Flooring and ceilings

1 mark @ = 04 marks

6.(a) (1mark@=5marks)

i. **O Horizon** (Organic Layer), Also called: Humus layer, Present mainly in forested or undisturbed areas Contents: Decomposed leaves, plant material, and organic matter

ii. **A Horizon** (Topsoil), Characteristics: Dark in color due to organic matter

iii. **B Horizon** (Subsoil), Characteristics: Lighter in color, denser and Accumulated clay, iron, and minerals leached from the A horizon

iv. **C Horizon** (Parent Material), Contents: Partially weathered rock and loose material

Determines the mineral composition of the upper layers.

v. **R Horizon** (Bedrock), Also called: Rock layer, Contents: Unweathered solid rock

Function: Base layer from which soil forms through weathering over time

(b) ways of applying OM.

i. Apply Compost: Decomposed kitchen waste, plant material, or animal manure

ii. Use Animal Manure: Cattle, goat, poultry, or pig manure (well-rotted) by applying in planting holes, beds, or mix into the soil

iii. Grow Green Manure/Cover Crops-growing plants (e.g., legumes like cowpeas, clover, or sunhemp)

iv. Add Crop Residues: Leftover stalks, leaves, or roots from previous crops

v. Use Mulch (Organic Mulching), Grass clippings, straw, leaves, sawdust, or woodchipsSlowly decomposes and adds organic matter over time

(1mark @=4marks)

7.(a) Aspects

(i). Prior arrangements before harvesting

(ii) Quality of fish to be harvested

(iii)stop feeding fish before harvesting

(iv)Drainage of ponds

(v) Grading of fis**h.**

(1 mark @= 05 marks)

(b)

(i)Use of easy to clean containers

(ii) Handle fish gently

(iii)Ensure personal handling fish

(iv)Follow good hygiene practice

(v) Storage and transportation of fish

8. (a) criteria for selecting planting materials:

(i) Suitability of the materials to the ecological condition

(ii) Purity of the materials

(iii)Germination percentage

(iv)Disease resistance

(v) Certified planting materials

1marks @ =05 marks

(b) factors affecting depth of planting

(i) Seed size

(ii) Soil type

(iii) Soil moisture content

(iv) Type of seedling emergence during germination

(v) Ecological condition of the area

1marks @ =04 marks

SECTION C (30 MARKS)

INTRODUCTION **(02 marks)**

MAIN BODY **(12 Marks)**

(a) Type of soil: The type of soil affects the irrigation method to be used as well as the irrigation frequency and rates. Sandy soils typically require frequent applications of water at a high rate to keep moisture in the root zone. Lighter clay soils can hold moisture longer than sandy soils but may require frequent applications at a lower rate to prevent run-off.

(b) Topography of the land: Hilly or sloping land can be a challenge. Sprinkler or drip irrigation are preferred over surface irrigation to steeper or unevenly sloping lands as they require little or no land levelling.

(c) Local weather patterns of the area: Under very windy conditions, for instance, drip or surface irrigation is more suitable than overhead irrigation. This is because strong wind can disturb the spraying of water from sprinklers. Similarly, in arid areas with low humidity, sprinkler irrigation is not suitable since water losses due to evaporation can be extremely high. Instead, drip irrigation works well in both of these situations.

(d) Type of crops to be irrigated: Surface irrigation can be used for all types of crops. Sprinkler and drip irrigation are mostly used for high value cash crops such as vegetables and fruits because of their initial high capital investment. They are rarely used for lower value staple crops. Also drip irrigation is not suitable for close growing habit crops.

(e) Water availability and quality: Water application efficiency is generally higher with sprinkler and drip irrigation than surface irrigation. Sprinkler and drip irrigation are preferred when water is in short supply. If the irrigation water contains dissolved salts, drip irrigation is particularly suitable

(f) Costs and benefits: In choosing an irrigation method, an estimate must be made on the costs and benefits of the available options. On the cost side, not only the construction and installation

but also the operation and maintenance costs should be taken into account. These costs should then be compared with the expected benefits.

(g) Required labour inputs: Surface irrigation often requires a much higher labour input for construction, operation and maintenance than sprinkler or drip irrigation. Surface irrigation requires accurate land levelling, regular maintenance and high level of farmers' organization to operate the system. Sprinkler and drip irrigation require little land levelling. In terms of system operation and maintenance, sprinkler and drip irrigation are less labour intensive.

(h) Level of technology and capital required: Type of technology affects the choice of irrigation method. In general, drip and sprinkler irrigation are technically more complicated methods. Also the purchase of equipment requires high capital investment.

ANY SIX (06 POINTS)

CONCLUSION (1 MARKS)

10. INTRODUCTION (02 MARKS)

MAIN BODY

(i) Land availability: The size of available land shall determine the type and number of animals that can be kept and the rearing system that can be used. For example, in the area with limited land size, it is a good practice for animals to be reared indoors.

(ii) Water resources: All livestock enterprises need adequate amount of water. You need to ensure that clean water is available all the time. Possible sources of water include rivers, dams, wells, tap water and rainwater.

(iii) Feed availability: Without feeds no animal can survive. When planning for livestock enterprise, one needs to make proper feed budget before and after bringing animals on the farm unit.

(iv) Markets of livestock and livestock products: Suitable type of livestock or livestock products are the ones that customers need and can be able to purchase. For profitable livestock

enterprise, it is also essential to ensure that your livestock are properly managed and livestock products are well handled until they reach markets to meet consumer's requirements.

(V) Diseases and parasites prevailing in your area: In planning any livestock enterprise, you should identify the possible diseases and parasites in your area that can affect your livestock. Based on this factor, prepare a diseases and parasites control program .

(vi) Purpose of keeping the selected livestock species: Different livestock are kept for different purposes. You can plan to benefit from livestock or livestock products or both. Some livestock products that can be harvested are eggs, meat and milk. Animals can offer draught power. Also, other by-products can be derived from farm enterprise, such as manure, hides and skins.

(vii) Manure disposal: Livestock kept intensively normally produce a large amount of manure. Depending on the location of the farm, manure can be a nuisance to surrounding community, causing misunderstanding.

(viii) **Social customs and norms:** when you plan to keep livestock, consider the social customs and norms of the community. It is very important to avoid social conflicts in the community for your farm enterprise to prosper. Choose and manage farm enterprise by considering culture, beliefs and other social customs of the surrounding community.

ANY SIX (06) POINTS (1 MARKS @ =12)

CONCLUSION = 1 MARKS

11. INTRODUCTION (2 MARKS)

MAIN BODY (12 MARKS)

(a) Grading Agricultural produce are graded according to quality specifications of the destined market. For example, Arabica coffee is graded based on weight and size. Grading is a marketing function which enables market penetration of the farm produce.

(b) **Standardization:** means the establishment and maintenance of uniform measurement of produce in terms of quality and quantity for different commodities to meet specification of a particular market.

(c) Processing: this is the conversion of farm produce from raw state into consumable form. Examples include the conversion of wheat into flour, preparation of butter and ghee from milk and hulling of paddy into rice.

(d) Packaging: this is a marketing function that refers to all activities related to designing, evaluating, and making containers/wrapping materials for a product. Packaging involves preservation and storage of agricultural products designed to serve a certain market.

(e) **Storage and handling:** Storage involves handling and preserving of farm produce from the time they are produced to the time they are needed for consumption. Storage of farm produce can be done by using cold rooms, refrigerators, warehouse and silos.

(f) Transportation: Physical movement of farm produce from the point of production to the final consumer is called transportation. Transportation creates place utility. It takes place through different means including road, rail, air, and water.

(g) **Distribution**: Consumable agricultural commodities have to be brought from the farm to the local market; then to primary wholesale markets, secondary wholesale, retail markets and ultimately to the consumer. Farm inputs such as fertilisers, seeds and insecticide from factories must be taken

(h) Selling: This is another type of the marketing function that generates revenue to the organisation or an individual. It brings together sellers and buyers either face to face or through other means of communication.

(i) Buying: Buying is one of the most important agricultural marketing functions whereby motives of two different actors meet. Buyers' motive can either be to make profit or satisfy their needs

(j) Marketing intelligence: Marketing intelligence is a process of collecting, interpreting and disseminating information relevant for marketing decisions. In practice, during buying and selling, some terms of doing business will be stipulated and agreed by both actors (seller and buyer).

ANY SIX (06) POINTS =(12 MARKS)

CONCLUSION (01 MARK)