

443/1
AGRICULTURE
PAPER 1
TIME: 2 HOURS

Kenya Certificate of Secondary Education (K.C.S.E)

MARKING SCHEME

SECTION A (30 MARKS)

1. Give two sub branches of arable farming (1mk)
 - Field crop cultivation
 - Horticulture
2. State four biotic factors that influence Agriculture negatively (2mks)
 - Pathogens
 - Pests
 - Parasite
 - Weeds
 - Predators

3. **Distinguish between grading and standardization in Agricultural marketing (2mks)**
Grading – sorting into uniform lots of certain qualities
Standardization – establishing uniformity in quality and quantity of products
4. **Give four benefits of title deeds to a farmer (2mks)**
- A farmer can mortgage the land by offering land/title deed as a security to loaning agency
 - No disputes
 - A legal owner of the land has security of tenure and can invest and improve productivity
 - A farmer who can't operate the farm can still earn income from leasing it
5. **State four control measures of riverbank erosion (2mks)**
- Construction of dams
 - Construction of dykes
 - Planting trees along riverbanks
 - Observing government regulations on leaving a sizeable strip of uncultivated land along river banks
6. **Name any four methods of farming (2mks)**
- Shifting cultivation
 - Nomadic pastoralism
 - Agroforestry
 - Organic farming
 - Mixed farming
 - Ranching
7. **Outline two conditions that should be met by a good rootstock (1mk)**
- Free from pest and diseases
 - Resistance to viral diseases
 - Compatible with the scion
 - Adapted to wide range of soil PH
8. **Differentiate between seed dressing and seed inoculation as used in agricultural production (2mks)**
- Seed dressing – coating seeds with suitable insecticides and fungicides to guard against soil born, pest and diseases
 - Seed inoculation – is the coating of leguminous seeds with the right strain of nitrogen fixing bacteria to enhance Nitrogen fixation
9. **List any four agroforestry trees grown in the farm (2mks)**
- Whistling pine
 - Calliandra
 - Pigeon peas
 - Sesbania sesban
 - Grivellia robusta
10. a) **State the effects of the following weeds to the livestock produce (1mk)**
- i) **Mexican Merigold**
Tainting in milk

- ii) **Thorn apple**
Poisonous to livestock

b) **Name the parts harvested of each of the following crops** (1mk)

- i) **Onions**
Bulbs

- ii) **Coffee**
Berries

11. **State four farming practices that encourage soil erosion** (2mks)

- Ploughing up and down the slope
- Cutting down trees
- Continuous cropping
- Ploughing along riverbanks
- Overgrazing

12. **Name three varieties of the carrots** (1½mks)

- Red coloured chantenary
- Imperator
- Royal chantenary
- Nantes

13. **Name four crops where training is carried out** (2mks)

- Tomatoes
- Passion fruits
- Water melon
- Pumpkins

14. **Name three sources of nitrogen for plants** (1½mks)

- Organic manure
- Nitrogen fixation
- Free living bacteria in soil
- Inorganic fertilizers i.e CAN

15. a) **Name two types of inventory records kept on the farm** (2mks)

- Permanent goods inventory
- Consumable goods inventory

b) **State two uses of inventory records on the farm** (1mk)

- Shows various inputs used in production
- Determine goods to acquire and replace
- Detects loss and theft

16. **State two conditions that must exist for a market to be purely competitive** (1mk)

- Many sellers of same products
- Price of same product is same allover

17. **Give two precautions that should be observed when storing Nitrogenous fertilizer** (1mk)

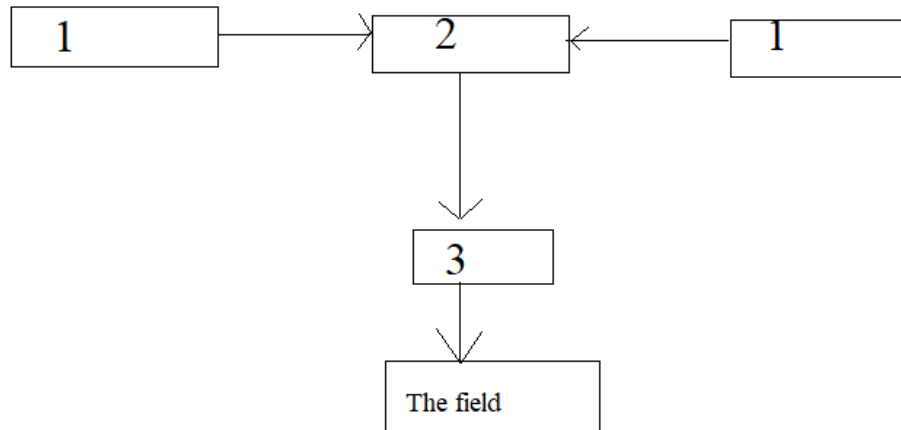
- Should be kept in dry conditions

- Do not store in open containers
- Should not be stored in metal containers

SECTION B (20 MARKS)

Answer all questions in this section

18. Illustrated below is a method of turning compost. Study the method and answer the questions that follow



- Identify the method** (1mk)
Four heap system
 - Using arrows in the diagram show how the turning is done before the manure can be taken to the field** (2mks)
 - After how long should the compost be ready for use** (1mk)
Three months
 - Name any other type of organic manure apart from the one named above** (1mk)
 - Green manure
 - Farm yard manure
19. **An agriculture student was advised to apply a complete fertilizer 40: 30:10 in a 20m by 10m plot and at the rate of 400kg per hectare**
- What do the figures 40 and 10 stand for?** (1mk)
40 stands for percentage of Nitrogen
10 stands for percentage of Potassium oxide
 - Calculate the percentage of P₂O₅ (phosphorous pentoxide) in the complete Fertilizer** (2mks)

$$\begin{aligned} \text{Total ratio} &= 40 + 30 + 10 = 80 \\ \text{Therefore P}_2\text{O}_5 \text{ as percentage of total} &= \\ \frac{30}{80} \times 100 &= \frac{3000}{80} \\ &= 37.5\% \end{aligned}$$
 - Calculate the amount of fertilizer the student would require for the plot**

(2mks)

$$1 \text{ ha} = 10,000\text{m}^2$$

$$\text{Area of land } 20\text{m} \times 10\text{m} = 200\text{m}^2$$

$$1 \text{ ha} = 400\text{kg of fertilizer}$$

$$1\text{m}^2 = \frac{400}{1000} = 0.4\text{kg}$$

$$1\text{m}^2 = 0.4\text{kg}$$

$$200\text{m}^2 = ?$$

$$\frac{400}{1000} \times 200 \\ = \underline{\underline{8\text{kg}}}$$

20. The illustration below shows a cropping program

BEANS	MAIZE
↑ KALES	↓ CASSAVA
↑ CABBAGES	← SWEET POTATOES

i. **Identify the cropping programme**

(1mk)

Crop rotation

ii. **Giving a reason , identify one mistake the farmer made when designing the above programme**

(2mks)

- Planting kales after cabbages

This will lead to build up of pests and diseases that attack members of brasicca family where kales and cabbages belong

iii) **State two advantages of this programme**

(2mks)

- Maximum utilization of nutrients in soil
- Controls soil borne pests and diseases
- Controls weeds
- Improvement of soil fertility
- Improvement of soil structure
- Control of soil erosion

21. Study the diagram below carefully and answer the questions that follow

a) **Identify the variety of sorghum in the diagram**

(1mk)

Goose necked variety

b) **Name two types of pests whose damage can be controlled by planting the above named variety**

(2mks)

- Weaver birds
- Starling bird

- Bishop birds
 - Sudan Dioch (*Quelea Quelea Ethiopica*)
- c) **State other two measures used to control the pest named in (b) above (2mks)**
- Planting bitter tasting coat varieties
 - Flame throwers
 - Explosives
 - Poisons
 - Spraying in their breeding colonies

SECTION C (40 MARKS)

22. a) **Discuss the importance of irrigation in farming (4mks)**
- Enables one to grow crops during dry season
 - It a method of land reclamation /allows crops production in arid and semi-arid areas.
 - Makes possible to grow crops in special structure e.g. green house
 - Enables one to grow crops that require high amount of water e.g. paddy rice (4mks)
- b) **Describe the management practices that should be carried out on a vegetable nursery after sowing seeds until the seedlings are ready for transplanting (8mks)**
- Mulching to conserve moisture
 - Erection of shade to minimize evapotranspiration
 - Weed control to reduce competition with seedling for nutrients, light and space
 - Pest and disease control to ensure healthy and vigorously growing seedlings
 - Pricking out/ thinning to minimize competition for growth elements
 - Fertilizer application to supplement nutrients in the soil
 - Watering to ensure adequate moisture supply
 - Hardening off/ removing shade / reducing watering to acclimatize the seedling to conditions in the fields
 - Removal of mulch immediately after germination
- c) **Explain eight factors that contribute to the competitive ability of weed (8mks)**
- Produce large quantities of seeds
 - Seeds remain viable for a long time
 - Some weeds have the ability to propagate both by seeds and vegetatively
 - They have efficient and effective mechanism of dispersal
 - They have elaborate root system
 - Some have underground structures difficult to control
 - Some are able to survive with limited nutrients
 - Some have short life span cycles
 - Some are allelopathic
23. a) **Describe maize production under the following sub headings (3mks)**
- i) **Land preparation**
- Clear all the vegetation
 - Should be done during dry season
 - Plough /dig deeply to eradicate perennial weeds
 - Harrow the land to obtain medium tilth

- ii) **Field practices** (5mks)
- Fertilizer application – DSP during planting applied in the furrows/holes
 - Top dressing using CAN when crop is knee high
 - Weed control done right from early stages of growth to reduce competition of moisture and nutrients
 - Pest control – pests include maize stalk borer army worms, aphids and birds should be controlled using appropriate pesticides
 - Disease control- should be controlled to prevent losses they include maize streak, rusts and smut
 - Harvesting – should be done at the right time to prevent weevil attack
 - It is done by removing the cobs by use of hand, sometimes by use of combine harvesters

- iii) **Post harvest practices** (5mks)
- Shelling – Removing grains from the cobs
 - Drying – to reduce/ moisture content
 - Cleaning – sorting to remove foreign materials or winnowing to remove chaff
 - Dressing – treating with an insecticide to prevent weevil attack
 - Packing – placement of grains in sacks for easy storage

- b) **Describe the cultural methods of controlling crop diseases** (7mks)
- Using healthy planting materials
 - practicing field hygiene – burning of crop residues that could be affected by diseases
 - Proper seedbed preparation e.g. removal of tree stumps to control armillaria root rot in tea and coffee
 - Proper spacing to control damping off in cabbage seedlings in the nursery bed
 - Heat treatment e.g. when controlling stunting disease in sugarcane
 - Proper drying of cereals and pulses to control fungal attack in the store
 - Use of resistant varieties e.g. control of coffee berry disease and coffee leaf rust by planting Ruiru II
 - Crop rotation –by alternating crops of different families

24. **Study the following information which was extracted from Mr Kiko's farm record on 31/12/2023 and answer the question that follow**

Loans payable to bank	Ksh. 300,000
Five Milking cows	Ksh. 250,000
400 layers	Ksh. 80,000
20 goats	Ksh. 30,000
Debts payable to co-operative	Ksh. 20,000
Buildings & structures	Ksh. 600,000
Bonus, payable to workers	Ksh. 19,000
Cattle feed in store	Ksh. 10,000
Animal drugs in store	Ksh. 4,000
Debts receivable	Ksh. 18,000
Breakages to repair	Ksh. 30,000
Cash at hand	Ksh. 20,000
Cash in bank	Ksh. 30,000
Spray equipment	Ksh. 12,000

- a) **Prepare a balance sheet of Mr. Kiko's farm using the information above**

(10mks)

Mr. Kiko's balance sheet as at 31/12/2023

ASSETS			LIABILITIES		
	Amount			Amount	
Fixed assets	ksh	cts	Long term liabilities	ksh	cts
Building & structures	600,000		Loan payable		
Five cows	250,000		Bank	300,000	
400 layer	80,000				
20 goats	30,000				
Spray equipment	12,000				
TOTAL	972,000		TOTAL	300,000	
Current Asset			Current Liabilities		
Cattle feeds in store	10,000		Dept to cop	20,000	
Animal drug in store	4,000		Bonus payable to Workers	19,000	
Debt receivable	18,000		Breakages & repair	30,000	
Cash at hand	20,000		Total	69,000	
Cash at bank	30,000		Total liability	369,000	
Total	82,000				
Total asset	1,054,000				
			Capital	685,000	
Total	1,054,000			1,054,000	

b) Describe five effects of crop pest

(5mks)

- Transmits crop diseases
- Some unearth planted seeds
- Deprive plants of food by sucking sap
- Lowers quality of flowers and fruits

c) Give five reasons why land consolidation should be encouraged in Kenya

(5mks)

- Proper supervision
- Saves time and travel cost
- Encourage soil conservation
- Enhance weed and disease control
- Encourage sound farm planning