AGRICULTURE PAPER 1

ANSWERS

KCSE 2010

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1 Agriculture Paper 1

SECTION A. (30 marks)

1. **Disadvantages of intensive system of farming.**
   - Requires high initial capital/ its expensive
   - Is labour intensive
   - Requires high level of management/skilled labour. (2 x ½)(1 mark)

2. **Methods of farming**
   - Shifting cultivation
   - Nomadic pastoralism
   - Organic farming
   - Mixed farming
   - Agroforestry 4 x ½)(2 marks)

3. (a) **Nitrogen Fixation:**
   - Process in which atmospheric nitrogen is converted to nitrates for plants uptake (1 x 1)(1 mark)

   (b) **Phosphorus fixation:**
   - Process in which phosphorus combines with other elements to form compounds that cannot be absorbed by plants. (1 x 1)(1 mark)

4. **Reasons for keeping livestock health records**
   - Help in calculation of treatment and health costs
   - Help in cutting/selecting livestock
   - Help in future treatment and control measures
   - Help determine the common diseases and parasites/prevalent diseases and parasites
   - Help to support livestock insurance claims (4 x ½)(2 marks)

5. **Relationship between scarcity and choice**
   Scarcity is where production resources are limited in supply relative to demand. Therefore a choice has to be made on which enterprise(s) to allocate the limited resources.
   (2 x 1(2 marks)

6. **Reasons for land fragmentation**
   - Buying/selling/paying debts/compensation
   - Inheritance
   - Settlement and resettlement
   - gift/donation (2 x ½)(1 mark)

7. **Advantages of individual owner operator tenure system**
   - Easy to acquire credit
   - Land disputes are minimized
   - Long term investment is encouraged
   - Incentive to conserve and improve land
   - Easy to plan and make decisions
   - Easy to sell/lease all or part of farm (4 x ½)(2 marks)

8. Features for choosing water pipes
   - Durability
   - Strength/ability to withstand pressure/thickness of the wall of pipes

- Diameter/size of the pipe
- Workability/manoeuverability of the pipe
- Colour of the pipes

(4 x ½)(2 marks)

9. **Reasons for treating water**
   - Remove chemical impurities
   - Kill disease causing micro-organisms
   - Remove bad smells and taste
   - Remove impurities of solid particles

(4 x ½)(2 marks)

10. **Statutory boards**
   - Kenya Sugar Board/authority
   - Kenya Tea Development Authority/Agency/Tea Board of Kenya
   - National Cereals and Produce Board
   - Coffee Board of Kenya
   - Pyrethrum Board of Kenya
   - Cotton Lint and Seed Marketing Board/Cotton Board of Kenya
   - Horticultural Crop Development Authority
   - Kenya Sisal Board

(4 x ½)(2 marks)

11. **Marketing functions of KCC**
   - Buying and assembling milk/collection of milk
   - Processing milk
   - Market research
   - Advertisement/promotion of milk/milk products
   - Strategic storage of milk/milk products
   - Distribution of milk/transportation
   - Selling milk
   - Packaging and packing
   - Risk bearing
   - Financing
   - Grading/standardization (4 x ½)(2 marks)

12. (a) **Rolling**
   - Increases seed sol contact
   - Compacts soil/seeds to protect it against agents of erosion
   - Crushing large soil clodes
   - Levelling (2 x ½)(1 mark)

   (b) **Levelling**
   - Ensures uniform depth of planting/uniform germination/uniform fertilizer application
   - Ensures uniform water level in paddy rice fields
   - Removing depressions that collect water leading to rotting of seeds (2 x ½)(1 marks)

13. **Activities in clearing land**
   - Tree felling
   - Stumping/removal of stumps/destumping
   - Slashing (3 x ½)(1½ marks)

14. **Advantages of zero grazing**
   - Requires little land
   - Quick accumulation of manure
   - Easy to control diseases and parasites
   - Less wastage of feeds
   - Has high stocking rate

- High milk yield
- Efficient use of fodder

(5 x ½)(2½ marks)

15. **Factors determining stage of crop harvesting**
- Intended use of the crop
- Chemical concentration of the produce/stage of maturity/change in colour
- Prevailing weather conditions
- Market demand for the produce/market price

(4 x ½)(2 marks)

16. (a) **Growth cycle**
- Annual weeds
- Biennial weeds
- Perennial weeds

(2 x ½)(1 mark)

(b) **Plant morphology**
- Broad leaved weeds
- Narrow leaved weeds

(2 x ½)(1 mark)

SECTION B (20 marks)

17. (a) **Weed**
- Couch grass */Digitaria scalarum*

(1 x ½)(½ marks)

(b) **Why it is difficult to control**
- Presence of underground stems/rhizomes which are difficult to control

(1 x 1)(1 mark)

(c) **Control**
- Uprooting
- Cultivation
- Slashing
- Use of herbicides
- Mulching

(4 x ½)(2 marks)

18. (a) **Soil sample with highest acidity**
- Sample S_1

(1 x ½)(½ mark)

(b) **Lowering pH**
- Application of acidic fertilizers/sulphate of ammonia/ASN/DAP/MAP
- Application of sulphur

(2 x ½)(1 mark)

(c) Soil sample suitable for tea growing
- S_2
- S_3
- S_4

(1 x ½)(½ marks)

19. **Preparation of tree seeds after collection**
- Extraction to remove seeds from pods/fruits
- Drying to reduce seed moisture content
- Testing to verify seed quality
- Treatment to bread dormancy/improve germination
- Seed dressing to control soil borne pests and diseases
- Seed inoculation to N-fixation in legumes
- Washing/cleaning to remove mucilage

(4 x 1)(4 marks)

20. (a) (i) **Correct pruning**
- B

(1 x ½)(½ mark)

(ii) **Reason**
- Slant cut is a few centimetres above the bud/leaf

(1 x 1)(1 mark)

(b) **How pruning controls diseases**
- Removes diseased parts
- Creates unfavourable conditions/environment for disease agents
- Facilitates penetration of chemical sprays

(2 x ½)(1 mark)

21. **KABURU FARM CASH ANALYSIS FOR JANUARY 2009**

RECEIPTS (SALES AND RECEIPTS)						EXPENDITURE (PURCHASES AND EXPENSES)				
Date	Description	Total Ksh.	Cash Ksh.	Live-stock Ksh.	Crop Kshs.	Date	Description	Total Ksh.	Crop Ksh.	Live-stock Kshs.
01/1/09	Cash in hand	30,000	30,000			15/1/09	Seeds for planting	7,500	7,500	
05/1/09	Livestock sales	80,000		80,000		20/1/09	Paid KFA for fertilizer	16,400	16,400	
08/1/09	Crop sales	50,000			50,000	25/1/09	Bought livestock feed	50,000		50,000
31/1/09	Cash for milk delivery	120,000		120,000		30/1/09	Paid wages for planting & weeding	56,000	56,000	
						31/1/09	Transport charges for milk delivery	9,000		9,000
	TOTAL	280,000	30,000	200,000	56,000			138,900	79,900	59,000
		280,000	-	-	-		Closing balance/ TOTAL	141,100 280,000	-	-

Award of Marks
- Correct labelling of expenditure and receipt columns 1 x ½ = ½ mark
- Correct entries by dates 9 x ½ = 4½ marks
- Balancing ½ = 1 mark

22. (a) **Figures 18: 46: 10 on a fertilizer bag means**
- 18% Nitrogen
- 46% phosphorus pentaoxide (P_2O_5)
- 10% potassium oxide (K_2O)

(3 x ½)(1½ marks)

(b) **Filler material**

= 100 – (18 + 46 + 10) ½ mark

= 100 – 74

= 26%/26 kg ½ mark

(2 x ½)(1 marks)

SECTION C (40 marks)

23. (a) **Factors that encourage soil erosion**
- Lack of ground cover exposes soil to agents of soil erosion
- Steep slopes increase the speed of surface run-off hence erosive power of water
- Light/sandy soils are easily carried away by agents of soil erosion
- Shallow soils are easily saturated with was and carried away
- High rainfall intensity

- Frequent cultivation/overcultivation pulverises the soil making it easy to detach and carry away
- Overstocking leads to overgrazing which destroys ground cover exposing it to agents of erosion
- Burning of/deforestation destroys vegetation cover and exposed soil to agents of erosion
- Ploughing up and down the slope creases channels which speed up and increases the erosive capacity of water
- Cultivation of river banks destroys riparian vegetation and destroys soil structure exposing it to agents of erosion.
- Cultivating the soil when too dry destroys soil structure making it to be eroded.
- Long slope increase volume of surface run off and speed of surface of runoff hence increasing erosion.
- High amount of rainfall leads to saturation increasing runoff.

(8 x 1)(8 marks)

(b) **Management practices carried out on vegetable nursery after sowing**

- Mulching to conserve moisture
- Provide shade to minimise evapotranspiration
- Weed control to reduce competition with seedlings for nutrients, light, space, etc.
- Pest and disease control to ensure healthy and vigorously growing seedlings
- Pricking out/thinning to minimise competition a for growth elements
- Fertilizer application to supplement nutrients in the soil
- Hardening off/removing shade/reducing watering to acclimatize the seedling to conditions in the field
- Remove mulch as soon as seedlings emerge. (7 x 1)(7 marks)

(c) Soil factors that determine a crop grown in an area

- Soil drainage/rate of water infiltration and percolation through the soil
- Soil structure/arrangement of soil particles or aggregates
- Soil nutrient content/variety and quantity of mineral nutrients in the soil
- Soil profile/oil depth: depth and arrangement of soil horizons in relation to the rooting system of the crop
- Soil pH/chemical properties of the soil/degree of acidity or alkalinity of the soil solution
- Soil borne pests and diseases/the prevalent pests/diseases in the soil

(5 x 1)(5 marks)

24. (a) **Effects of high temperature**

- Increases incidences of some pests/parasites and diseases
- Improves quality of certain crops e.g. citrus fruits
- Lowers quality of certain crops e.g. pyrethrum
- Increases rate of evapotranspiration in plants/wilting in plants
- Increase rate of growth for early maturity in crops
- Limits distribution of exotic livestock breeds
- Lowers production in livestock
- Influences design of farm building and structures
- Lowers labour productivity (5 x 1)(5 marks)

(b)(i) **Precautions observed in cotton harvesting**

- gunny/Sisal bags should not be used to prevent mixing of lint and sisal fibres which causes ginning problems
- Hands should be cleaned to avoid staining of the lint
- Picking should be done when the list is dry to prevent fibres from sticking together
- Use clean containers for picking
- Use different containers for AR (safi) and BR (fifi) grades of cotton to ensure quality/separate grade A from B
- Picking should be done immediately the balls open/split to prevent staining by dust/dirt
- Avoid picking leaves and twigs to avoid contamination

(4 x 1)(4 marks)

(ii) **Sugar cane harvesting**

- Harvested at the correct age13-22 months for plant crop/12-18 months for eratoon crop
- Take sugar same samples for testing to determine maturity
- Cut the mature cane at the base/near the ground
- Cutting off the green tops
- Strip off leaves from the stem/burn the cane before harvesting
- Deliver the cane to the factory with 48 hours/immediately after cutting
- Use a cane harvesting matchet.

(5 x ½)(3 marks)

(c) **Factors considered in farm planning**

- **Risk and uncertainties**: enterprises should be analysed to determine the risks and uncertainties involved.
- **Security:** enterprises which require more security should be near the farm house/consider provision of security.
- **Land size:** a large number of enterprises can be established on a large scale compared to a small scale farm.
- **Current trend in labour market:** to determine availability and cost of labour especially during peak period.
- **Farmers objectives and preferences:** to ensure the farmer who is the operator has a sense of ownership of the plan and brings about motivation.
- **Current market trends and prices of outputs:** to ensure consideration of enterprises with high profit returns.
- **Availability and cost of farm inputs:** to identify enterprises that are affordable and whose inputs are readily available.
- **Government policy/regulations:** to seek permission for enterprises undertaken on quota system e.g. coffee growing and avoid enterprises and farming systems prohibited by the government.
- **Environmental factors:** soil, climate and topography should be analysed to determine livestock and crop enterprises that are suitable to the local ecological conditions.
- **Communication and transport facilities:** to facilitate movement of outputs to the market and supply of inputs. Also help in conveying improved methods of farming and market trends.
- **Availability of capital:** to acquire farm inputs.
- **Possible production enterprises:** should be identified and analysed so that suitable and profitable enterprises are selected.

(8 x 1)(8 marks)

25. (a) **Physical methods of controlling crop pests**

- **Trapping/picking** and killing pests
- **Use of lethal temperature** to kill the pests
- **Flooding to suffocate** and kill the pests
- **Use of physical barriers** e.g. fences, rat guards, etc to keep the pests away from the crop/produce
- **Proper drying** to make penetration difficult
- **Use of explosives** to destroy breeding grounds and kill the pests
- **Suffocation**: carbon dioxide build up is used to suffocate pests in stores especially Cyprus bins.

(6 x 1)(6 marks)

(b)(i) **Field management of bulb onions**

- Weed control through shallow cultivation to avoid damage to the shallow onion roots
- Remove excess soil around the roots gradually to facilitate build expansion
- Water regularly at the early stages to ensure adequate moisture supply
- Top dress with nitrogenous fertilizer at appropriate rates
- Control pests e.g. thrips using appropriate pesticides
- Control diseases e.g. rust, mildews using appropriate method (4 x 1)(4 marks)

(ii) **Harvesting of bulb onions**

- Is done 4-5 months after planting/when leave wither/turn brown
- Break and bend the tops at the neck
- Harvesting is done by lifting/pulling/digging out the crop
- Leave the bulbs on the ground to dry for 3 days and turn frequently to ensure uniform drying (3 x 1)(3 marks)

(c) **Factors influencing seed rate**

- **Intended use of the crop** e.g. fodder maize required high seed rate than grain maize
- **Germination percentage** – high seed rate is required for seeds with low germination percentage
- **Method of planting**: broadcasting requires high seed rate than row planting
- **Number of seeds per hole**: two or more seeds per hole requires more seed rate than one seed per hole
- **Soil fertility**: poor/infertile soils required low seed rate because crops are widely spaced compared to fertile soils
- **Growth characteristic of the crop**: tall/tillering/indeterminate variety required low seed rate compared to short/less tillering/ determinate varieties
- **Spacing**: high seed rate is required in closer spacing than wider spacing
- **Seed purity**: impure seed/containing chaff and foreign materials will lead to high seed rate compared to pure seed.
- **Whether the crop is pure or mixed stand**: high seed rate for pure and low seed rate for mixed.

(6 x 1)(7 marks)