KCSE 2012

5.7 AGRICULTURE (443)

5.7.1 Agriculture Paper 1 (443/1)

SECTION A (30 marks)

1. (a) - bulbs/leaves
   (b) - roots
   (c) - berry/berries/cherries/fruits

   (3 × ½ = 1½ marks)

2. Biotic factors.
   - Pests .
   - Decomposers.
   - Pathogens
   - Nitrogen fixing bacteria.
   - Pollinators
   - Weeds
   - Predators

   (4 × ½ = 2 marks)

3. Methods for controlling Crop Pests.
   - Chemical
   - Biological
   - Cultural
   - Physical/mechanical
   - Legislation

   (4 × ½ = 2 marks)

4. Methods of harvesting water.
   (a) roof catchment.
   (b) rock catchment
   (c) Weir/Dam
   (d) Retention ditches/level terraces
   (e) micro-catchment.
   (f) water pans/ponds

   (4 × ½ = 2 marks)

5. Records kept by poultry farmer.
   - Egg production/ weight gain
   - Labour records
   - Feeding records
   - Health records
   - Marketing records
   - Inventory records

   (4 × ½ = 2 marks)

6. Disadvantages of using organic manures.
   - Low nutritive value per unit volume/weight.
   - Likelihood of spread of disease/pests/weeds.
   - Bulky/difficult to store/transport/apply.
   - Looses nutrients if poorly stored.
   - Difficult to quantify the amount of nutrient per unit volume/weight.

   (4 × ½ = 2 marks)

7. Classification of pastures.

- Pasture stand: Pure/mixed.
- Pasture establishment/natural/artificial.
- Ecological zone/altitude. (2 x $\frac{1}{2}$ = 1 mark)

8. Disadvantages of organic mulch.
- Expensive to transport and apply/bulky.
- Could be a fire risk.
- Provides breeding ground/hiding place for pests.
- Intercepts light showers of rainfall.
- Can spread pests, weeds/diseases. (4 x $\frac{1}{2}$ = 2 marks)

9. Advantages of crop rotation
- Ensures maximum utilization of nutrients.
- Controls build-up of pests/diseases/weeds
- Controls weeds that are specific to particular crops.
- Improves soil fertility when leguminous crops are included.
- Controls soil erosion when cover crops are included.
- Improves soil structure if grass lay included. (5 x $\frac{1}{2}$ = $2\frac{1}{2}$ mark)

10. Earthing up
- improves tuber formation/expansion/roots/pods formation
- Improves drainage around the crop
- Conserves water/soil
- Facilitates harvesting of tuber crops
- Root protection

(2 x ½ = 1 marks)

11. Harmful effects
- Lower crop yields.
- Lower quality of crop products
- Some harbour crop pests/diseases
- Some reduce labour efficiency
- Increase the cost of production.
- Suppress growth of crops through competition for light, space, etc.
- Some have allopathic effects on crops
- Some are parasitic to crops
- Some weeds block irrigation canals/channels

(4 x $\frac{1}{2}$ = 2 marks)

12. Advantages of shifting cultivation.
- No pest and disease build-up.
- Low capital requirement.
- No land disputes as land ownership is not individualised.
- Soil structure is maintained (3 x $\frac{1}{2}$ = $1\frac{1}{2}$ marks)
- Gives time of land to regain fertility

13. Advantages of Zero-grazing
- Quick accumulation of manure.
- Animal produce high yield due to less wastage of energy.
- Its easy to control diseases/parasites.

- Requires little land.
- Allows higher stocking rate.
- Animal use feeds without wastage.

(5 x $\frac{1}{2}$ = 2$\frac{1}{2}$ marks)

14. Harvest time.
- Market price.
- Weather conditions.
- Market demand.
- Purpose/intended use.
- Concentration of required chemicals.
- Taste and preference/form required

(4 x $\frac{1}{2}$ = 2 marks)

15. Land Reforms.
- Land consolidation.
- Land adjudication and registration/issue of title deeds.
- Land settlement and resettlement.
- Tenancy reform.
- Redistribution of land.
- Improved land legislation.
- Sub-division of land

(4 x $\frac{1}{2}$ = 2 marks)

16. Number of Secondary cultivations
- Type of crop to be established/ size of seed.
- Moisture content of soil
- Type of soil
- Conditions of land after primary cultivation.
- Amount of organic matter on the surface.
- Vulnerability to soil erosion

(4 x $\frac{1}{2}$ = 2 marks)

SECTION B (20 marks)

17. (a) Gabion/porous dam (1 mark)

(b)
- Slows down the speed of water thus reducing its erosive power.
- It traps the detached soil particles.

(2 x 1 = 2 marks)

18. (a) As the price of the commodity increases the quantity demanded decreases and vice versa. (1 x 1 = 1 mark)

(b)
- If there is an increase in the income of consumers.
- Effective advertisement/sales promotion.
- Increase in the price of a related/substitute.
- If there is an increase in population.
- Change in taste and preference.
- If the quality of the commodity goes up.

(3 x 1 = 3 marks)

19. (a) Oxalis/oxalis latifolia. (1 mark)
(b) Broad-leaved weed. (1 mark)
(c) Presence of underground bulbs. (1 mark)

20. (a) Alley cropping/hedge row. (1 mark)
(b)
- Source of fodder when tree foliage is cut and fed to livestock.
- Improves soil fertility through nitrogen fixation/nutrients cycling.
- Facilitates soil and water conservation when roots bind soil particles.
- Smothers weeds
- Source of mulching material/wood fuel/compost manure

(3 x 1 = 3 marks)

21. (a) Cutworm. (1 mark)

(b)
- Early planting for crop to establish early and outgrow the pest.
- Application of appropriate pesticide to kill it.
- Field hygiene to prevent transmission from previous crop residues.
- Physical killing and destruction (2 marks)

22. (a) Soil capillarity (1 mark)

(b) The smaller the size of the particles the greater the force of capillary. (1 x 1 = 1 mark)

(c) Soil labelled L. (1 x 1 = 1 mark)

SECTION C (40 marks)

23. (a) Five factors to consider in farm planning.

- Environmental factors/climate/soil type; because these will determine the specific enterprises that are possible in an area.
- Size of the farm; as this will determine the size/number of enterprises that are possible.
- Farmer's objectives and preferences; so that the farmer will have a sense of ownership of the farm plan for motivation.
- Government regulations or policy; to ensure that laws are not flouted.
- Availability and cost of farm input/cost of labour/cost of production/capital availability; to select an enterprise that is affordable.
- Security of enterprise so as to ensure safety.
- Trends in the labour market; to ensure labour availability throughout.
- Existing market conditions and price trends; so that whatever is produced is sold at appropriate prices.
- Communication and transport; to ensure that produce reach markets and inputs are easily accessed.
- Possible production enterprises; so as to choose the most profitable and convenient.

(5 x 2 = 10 marks)
(Factor 1 mark, Explanation 1 mark)

(b) Transplanting of tomato seedlings.

- Should be done when seedling are pencil size thick/ one month to one and half month old.
- Nursery should be watered before to ease lifting of seedlings.
- Use garden trowel/ensure that seedlings are lifted with lump of soil around roots.
- Apply appropriate pesticide in the planting holes to control pests and diseases.
- Apply phosphatic fertilizers/manures in the planting holes.
- Mix pesticides/manure/fertilizer with soil thoroughly
- Lift only healthy and vigorous seedlings from the nursery.
- Plant one seedling per hole at the same depth as was in the nursery.
- Transplanting is preferably done in the evening or on a cloudy day.
- Mulch the transplanted seedlings if necessary.
- Provide temporary shade to the transplanted seedlings.
- Water the seedlings as necessary.
- Place soil around the seedlings and firm
- Holes are dug at a spacing of 60 - 100 cm × 50 - 60 cm.
- Transplant at the onset of the rains/when soil has enough moisture.
- Transport seedlings carefully/use a wheelbarrow.
- Planting holes are dug at a depth of 15 cm.

(10 x 1 = 10 marks)
(Maximum 10 marks)

24. (a) **Siting a vegetable nursery**.

- Near a water source for easy watering.
- In a well sheltered place to prevent strong winds which can uproot seedlings and cause excessive evaporation.
- Security so as to protect from theft and destruction by animals/birds.
- On a gentle slope to prevent erosion through run-off and to prevent flooding.
- Type of soil, should be well drained and fertile.
- Previous cropping, avoid an area where same crop family had been planted to avoid pest and diseases attack/build up.
- Near the seedbed/main field to minimise damage to seedlings during transplanting.
- Accessibility for easy movement.
- Away from shading effect to allow proper access to light.

(5 x 1 = 5 marks)

(b) **Selecting seeds for planting.**

- Adaptability: should be adapted to local ecological condition.
- Physical deformities/damages: should be free from physical deformities/damages.
- Health - should be free from pests/disease.
- Viability/germination percentage: - should have high viability/germination percentage.
- Parent plant - should be from high yielding/healthy parents/high quality/early maturing/dis ease resistant.
- Purity - should be clean / free from impurities.
- Maturity - should be of correct maturity stage.
- Age/storage period: - seeds stored for long periods have low viability/germination percentage hence should not be selected.
- Size of the seed, should be of correct size.

(6 x 1 = 6 marks)

(c) **Environmental factors.**

(i) **Temperature**

- Affect quality of certain crops e.g. pineapples, pyrethrum.
- Influence rate of the physiological processes in a crop.
- Cause increase in incidences of diseases.
- Low temperatures cause frost injury.
- High temperature increase rate of evapotranspiration hence wilting.
- Influences distribution of crops.

(4 x 1 = 4 marks)

(ii) **Wind**

- Strong winds increase the rate of evaporation/evapotranspiration/wilting.
- Influences amount of rainfall in a given area.
- Help in pollination of crops.
- Strong winds have a cooling effect which influences rate of physiological processes.
- Strong winds may cause soil erosion.
- Strong winds may cause lodging of certain crops/destruction of crops/crop structures.
- Winds can spread diseases/pests/weeds.
- Wind helps in seed dispersal.
- Wind is used in cleaning/winnowing grains. (5 x 1 = 5 marks)

25. (a) **Purchase Order.**

- Quantities of the goods.
- Type of goods required.
- Date of order
- Date within which the ordered goods should be delivered.
- Person who orders the goods.
- Person who authorized the order.
- Purchase order serial number. (5 x 1 = 5 marks)
- Total amount involved/total cost involved/total cash.
- Name of supplier.
- Cost of goods per item.

(b) **Harvesting of tea**.

- Leaves are picked selectively for the highest quality.
- Pluck top two leaves and the bud.
- Use a plucking stick to maintain the plucking table.
- Pluck at 5 - 7 days intervals in rains and 10 - 14 days in dry periods.
- Put plucked tea in woven baskets to facilitate air circulation/ prevent fermentation.
- Do not compress the leaves in the baskets to prevent heating up/ browning.
- Put plucked tea in cool and shaded place.
- Deliver to the factory on the same day.

(6 x 1 = 6 marks)

(c) **Importance of Irrigation.**

- Irrigation increases crop yields and ensures a steady supply of food throughout the year.
- Maximises the utilization of resources e.g. in places where the soil is fertile but the water/rain is inadequate.
- Important for the reclamation of arid and semi-arid land.
- Provides a regular, reliable and adequate supply of water in areas with little or no rainfall.
- source of employment in areas where it is used extensively.
- Promotes crop production for the export market and therefore contributes to a country's revenue.
- Allows production of paddy rice.
- Allows growing of crops in green houses.
- Facilitates fertigation in crop production.
- Controls pests.

(5 x 1 = 5 marks)

(d) **Role of magnesium**

- Important in chlorophyll formation.
- Promotes the formation of fats and oils in crops e.g. soya beans, sunflower, ground nuts.
- Aids in the absorption and translocation of phosphorous.
- Enhances the nitrogen fixing power of the legumes.
- Activates the synthesis and translocation of carbohydrates and proteins in plants.
- Activates enzymes.

(4 x 1 = 4 marks)