

FORM FOUR JOINT EVALUATION 2017

MARKING SCHEME

443/1

AGRICULTURE PP1

SECTION A (30MARKS)

1. **Two** ways in which agriculture contributes to industrial development **(1mark)**
 - **Provide raw materials for industries**
 - **Provision of market for industrial goods**
2. **Three** reasons why organic farming is encouraged in farming. **(1½marks)**
 - **Environmental friendly**
 - **Products do not have organic chemical residue**
 - **Improve soil structure**
 - **Replenishes nutrients in the soil as it uses organic manure**
 - **Enhances soil water retention**
 - **Provides food for soil microbes**
 - **Enhances soil water infiltration**
3. **Three** ways through which relative humidity affect crop production. **(1½marks)**
 - **High humidity reduces rate of water loss in crops**
 - **High humidity increases incidences of crop diseases and pest**
 - **Low humidity increases the rate of evapotranspiration which may result loss plant moisture/ leading to wilting of crops**
4. **Four** ways by which biological agents can enhance the process of soil. **(2marks)**
 - **Large animals trample on soil breaking it further**
 - **Soil living organisms excreta build the soil particles together**
 - **Plant roots exert pressure on rocks causing disintegration**
 - **Burrowing animals bring about soil aeration**
5. **Two** properties of soil that is influenced by soil texture **(1marks)**
 - **Drainage**
 - **Water holding capacity**
 - **Aeration**
6. **Two** practices that are carried out to ensure uniform germination. **(1mark)**
 - **Rolling**
 - **Leveling**

7. **Four** factors that determine the number of cultivations when preparing a seedbed
(2marks)
- **Soil moisture content.**
 - **Size of the planting materials.**
 - **Condition of the soil after primary cultivation.**
 - **Slope of the land.**
8. Functions of the following chemicals as used in water treatment; **(1mark)**
- a. Chlorine- **kill disease causing organisms**
 - b. Aluminum Sulphate (Allum)- **coagulate solid particles**
9. **Two** types of pumps used in the farm for lifting water. **(1mark)**
- **Hydram**
 - **Piston**
 - **Rotary pump**
10. List **four** characteristic of fertile soil **(2marks)**
- **Proper drainage**
 - **Free from pests and diseases**
 - **Adequate nutrient supply**
 - **Free from weeds**
 - **Correct p^H**
11. When preparing compost manure, state the importance of each of the following:-
(1mark)
- a. Addition of ash-**increases the amount of potassium in manure**
 - b. Regular turning of the compost manure-**to enhance even decomposition**
12. **Four** pieces of information recorded in a field operation record. **(2marks)**
- **Field number**
 - **Type of crop planted**
 - **Type and amount of fertilizer used**
 - **Date of planting**
 - **Date of harvesting**
 - **Seed rate**
13. **Two** pieces of information that soil sample should have before being taken to the laboratory for testing. **(1mark)**
- **Name and address of the farmer**
 - **Date of sampling**
 - **Types of tests to be carried out**
 - **Field number**
14. **Two** factors that determine the amount of inorganic fertilizers needed to be applied in a field of maize. **(1mark)**
- **Level of nutrients in the soil**
 - **Size of land**

15. **Four** ways of preparing planting materials before planting, **(2marks)**
- **Seed dressing to control soil borne pests and diseases**
 - **Seed inoculation to enhance nitrogen fixation**
 - **Breaking seed dormancy**
 - **Chitting in irish potatoes to enhance sprouting**
16. **Two** limitation of using polythene sheets as mulching materials in crop production. **(1mark)**
- **Prevent water penetration in the soil**
 - **Does not increase fertility unlike organic material**
17. **Four** control measures of river bank erosion **(2marks)**
- **construction of dam to regulate water flow**
 - **construction of dykes to control flooding**
 - **planting trees on the riverbank to hold the soil together**
 - **avoid cultivating along the riverbank**
18. **Four** factors that affect selectivity of herbicides. **(1mark)**
- **Plant morphology and anatomy**
 - **Herbicide characteristics**
 - **Herbicide concentration**
 - **Method of application**
 - **Herbicide formulation**
19. **Two** factors which affects the quality of standing forage given to livestock**(1mark)**
- **Forage species used**
 - **Stage of harvesting**
20. **Four** factors that determine the quality of hay **(2marks)**
- **Forage species used**
 - **Stage of harvesting**
 - **Length of drying period**
 - **Condition of storage structure**
 - **Weather condition during drying**
21. **Two** harmful effects of crop diseases. **(2marks)**
- **Lower crop yield**
 - **Lead to low quality crop produce**
 - **Cause food poisoning e.g. Aflatoxin**

SECTION B (20MARKS)

22 a) **Two** merits of horizon A (2marks)

- **Source of plant nutrients**
- **Support/anchor the crops**
- **Store of water for the crops**
- **Sources of soil micro organism**

b) **One** distinct feature of horizon B (1mark)

- **Deficient of humus(nutrients)**
- **Contain leached nutrients**
- **Contains more compact soil particles**

c) What does the term **transition zone** refer to in soil (1mark)

- **A zone bordering two adjacent layers of soil profile**

d) Name horizon **C** and state its importance. (1mark)

- **Substratum/weathered rock-give rise to subsoil/determines type of soil and mineral in the soil**

23. i. Identify the pest. (1mark)

- **Cut worm**

ii. **Two** damages caused by the pest to crops (2marks)

- **Cut and feed on the stem of the seedling**
- **Cut and feed on leaves that grow at the base of the seedling**

iii. **Two** methods of controlling the pest (2marks)

- **Use appropriate pesticide**
- **Hand picking and destroying them**

24. a) **Annual pruning**

b) **Two** reasons for carrying out the operation on crops. (2marks)

- **To regulate bearing**
- **To open the crop for light penetration**
- **Create unfavorable condition for pest and diseases**
- **To ease subsequent field operations**

c) **Two** perennial crops in which such operation is carried out **(2marks)**

- **Coffee**
- **Citrus**

25. a) i)

100 layers (Fixed number)	Layers mash Kg/week	Total egg production per week	Marginal production per week
100	0	140	0
100	10	155	15 ½mark
100	20	180	25 ½mark
100	30	240	60 ½mark
100	40	340	100
100	50	470	130 ½mark

ii) **Increasing returns production function.** **(1mark)**

b) **Two** reasons why a farmer should keep farm records. **(2marks)**

- **Give history of the farm**
- **Help to detect losses in the farm**
- **Assess whether the farm is making a loss or profit**
- **Help compare different enterprises and neighboring farms**

SECTION C (40MARKS)

26. a) Cultural methods of controlling crop diseases

- using healthy planting materials does not spread diseases
- using field hygiene like burning diseased crop residues/ roueaging/ clean planting tools
- weeding reduces spread of diseases
- proper spacing controls damping off and resettle diseases in groundnuts
- heat treatment in control of rations stunting diseases of sugarcane
- proper drying of grains and pulses to- avoid afflation
- use of diseases resistant varieties like Ruiru for coffee that is resistant to coffee berry diseases and leaf rust

7x1= (7marks)

b) Precautions taken during the harvesting of coffee

- Both grade one and two berries are taken to the factory on the same day
- Sorting of cherry at the factory has to- be done well
- Only the red ripe berries are picked
- The barriers are taken to the factory at the end of the harvesting seasons

4x1= (4marks)

c) Plant population

$$= \frac{\text{Area of land}}{\text{Spacing of crop}}$$
$$= \frac{4\text{m} \times 3\text{m}}{0.6 \times 0.6\text{m}} = \frac{12\text{m}^2}{0.36\text{m}^2} \checkmark 1$$
$$= 33 \text{ plants } \checkmark 1$$

Total= (2marks)

d) Factors that determine spacing of various crops

- Pest and disease incidences
- Soil moisture status
- Soil fertility
- Growth habit of the crop
- Type of machinery to be used
- Size of the plant
- Intended use crop

7 x 1= (7marks)

27. a) Disadvantages of tillage as a method of weed control

- Excessive tillage destroy soil structure leading to soil erosion
 - Exposes soil to evaporation hence loss of soil moisture
 - It is labour consuming i.e. requires a lot of man power
 - Disturbs roots retarding normal plant growth and damage underground structures
 - Not effective especially on wet soils as weeds re-establish quickly.
- 5x1=5marks

b) Benefits of minimum tillage in crop production

- To reduce cost of cultivation by reducing number of operation
- To control soil erosion through mulching and cover cropping
- To preserve soil moisture since several exposes soil to sun heat
- To prevent root exposure and damage of underground structures
- To reconstruct destroyed soil structure because continuous cultivation makes the soil loose

- To prevent exposure of humus to adverse conditions such as the suns heat that cause volatilization of nitrogen. 5x1=(5marks)

c) i) Irish potatoes

Variable costs

- Fertilizer =Kshs 10,000✓
- Labour 50x200 =Kshs 10,000✓
- Potato seeds =Kshs 20,000✓ Any correct 3x½=(1½marks)
- Fungicides =Kshs 5,000✓
- Ploughing =Kshs 4,000✓

Total variable costs =Kshs 49,000✓ (1mark)

Total revenue 10,000kgxKshs30=Kshs 300,000✓ (1mark)

Gross margin 300,000-49,000 =Kshs 251,000✓ (1mark)

Maize

Variable costs

- Ploughing =Kshs 4,000✓
- Maize seeds =Kshs 3,000✓ Any correct 3x½=(1½marks)
- Labour 150x200 =Kshs 30,000✓
- Fertilizers 10,000+4,800 =Kshs 14,800✓

Total variable costs =Kshs 51,800✓ (1mark)

Total revenue 7,500kgxKshs20 =Kshs150,000✓ (1mark)

Gross margin 150,00-51,800 =Kshs 98,200✓ (1mark)

ii) Irish potatoes

(1mark)

28. a) Ways in which land fragmentation increases the cost of food production in Kenya

- Leads to low food production due to poor supervision thus high cost of food
- Increased transport cost moving from one plot to another
- High Managerial cost for the different plots
- Increased cost of extension services visits
- High cost of pest, weed and disease control
- High costs of replacing temporal fences and other structures on the different plots

- **Poor farm mechanization causing manual operations which are expensive.**
Any other relevant point (Any correct 5 x 1mk =(5marks)

b) Kales production under;

i) Transplanting

- **Transplant when the seedling are 1 month/have 4-6 leaves/10-15cm high**
- **Water the nursery a few hours before transplanting**
- **Lift the seedling with a lump of soil around the base using garden trowel**
- **Plant at right spacing depending on the variety**
- **Plant the seedlings at the same depth they were in the nursery**
- **Firm the soil around the base and ensure no leaves touch the ground**
- **Mulch the seedling and water them** Any correct 4 x 1=(4marks)

ii) Disease control

- **bacterial leaf spot-use fo certified seeds/rogueing/crop rotation**
- **Black rot-crop rotation/rogueing/**
- **Fungal leaf disease-use suitable fungicide to treat seeds/rogueing.**

2 x 2=(2marks)

iii) Harvesting

- **Leaves are plucked after 3 months**
- **Harvest the lower leaves to avoid damage of the growing tips**
- **They are packed in airy bags and sold immediately.** 3 x 1=(3marks)

c) **Six** ways of increasing herbage yield in a grass-legume stand of forage.

- **Weed control using appropriate method to reduce competition for nutrients and moisture**
- **Topping to stimulate re-growth of pasture**
- **Top dressing help to increase total yield of the herbage**
- **Fencing to keep off livestock and human from destroying the herbage**
- **Pest control using the appropriate method to prevent damage of pasture by pests**
- **Irrigation during dry season to supply sufficient moisture for proper growth**
- **Reseeding of partially denuded areas increase the herbage.** 6 x 1=(6marks)

END