FORM FOUR TERM ONE EXAM 2017

AGRICULTURE PAPER 1
MARKING SCHEME

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SECTION A (30MKS)

1. **Characteristics of large scale farming**
   - Involves the use of large tracts/piece of land
   - Requires heavy capital investment
   - Use of skilled / trained labour
   - High level of management
   - Carried out for commercial purposes
   - Operation costs per unit of production are low / use of economies of scale. ***First 3 x ½ =(1 ½ mks)***

2. **Difference between grafting and budding**
   - Grafting is the practice of uniting two separate woody stems of botanically closed related plants/compatible. While budding refers to the practice of uniting a vegetative bud (scion) to a seedling of another plant (root stock) of the same species. ***(lx l= l mk) mark as whole***

3 **Pieces of information contained in a land title deed**
   - Size of land hectares
   - Land parcel number
   - Location of the land/adjudication area of the land
   - Type of ownership e.g absolute or lease hold
   - Conditions if any
   - Seal of the issuing office
   - Date of registration
   - Signature of the district registrar/name of the issuing officer. ***First 3 x ½ =(1 ½ mks)***

4 **Distinguish between**

i) Pricking out and thinning

Pricking out is the transfer of crowded seedling in a nursery bed to a seedling bed while thinning is the removal of excess seedlings on the farm/field. ***(1 x 1 = l mk as a whole)***

ii) **Nursery bed and a seedling bed**

A nursery bed is a small piece of land usually 1 M wide with convenient length where seeds are sown to grow into seedlings before transplanting while a seedling bed is a special nursery bed which receives seedling from a crowed nursery to reduce competition. ***(1 x 1mk)***

5. **Reasons for carrying out the following practices in a tomato nursery**

i) Avoid excess application of nitrogen

- Control of Blossom end rot disease (1 x 34 = ½ mk)

ii) Sinking the nursery bed below the ground

- Raise the water table of the nursery during the dry period /spell. (l x ½ = ½ mk)

iii) Hardening off

-Expose/climate seedlings to the harsh environmental conditions they are likely to fall in the field/harden the plants (1x ½ = ½ mk)

6. Two ways a cut off drain controls soil erosion (1 x ½ = ½ mk)
   - Increase water infiltration reducing surface run off
   - Collects excess water in the channel directing it to a water source
   - Grass strip titters/traps soil particles from the running water/slows down movement of water increasing water infiltration ***(First 2x ½ = ½ mk)***

7. Ways through which soil loses fertility
   - Leaching
   - Change of soil PH
   - Soil erosion
   - Burning of land/rolatilisation/dentrification
   - Excessive irrigation fixation of nutrients/nitrogen lock
   - Up
   - Soil capping

   - Monoculture/monocropping
   - crop pests and diseases
   - accumulation of salts
   - continuous cropping (first 6 x ½ =3mks)

8. **Examples of potassic fertilizers**

- potassium chloride (Kcl)
- Potassium sulphate (K_2SO_4) (2 x ½ = l mk)

9. **Diseases of leaf in sorghum**
   - Leaf blight (Helminthosporium urcium)
   - Auth racnose (colletotrichum gramicola)
   - Sooty stripe (Ramulispora sorghi)
   - Downy mildew (sclerospora sorghi)

10. **Reasons for forage conservation**
   - Spread available forage throughout the year
   - Proper utilization of land
   - Provide animals with feed during the dry spell
   - Earn income to farmers when sold as hay.

11. **Two positive effects of high environmental temperatures on crop farming**
   - Hasten the maturity of crops
   - Improve quality of certain crops such as fruits (2x ½ = lmk)

12. **Biological methods of soil erosion control**
   - A forestation
   - Strip farming
   - lntercropping
   - Contour farming (4x ½ =2mks)

13. **Types of labour records**
   - Muster roll
   - Labour utilization analysis (2x%= 1 mk)

14. **Physical methods of pest control**
   - Trapping and killing
   - Use of lethal temperatures
   - Flooding
   - Proper drying of grains

15. reasons for top dressing a pasture land
   - Replenish soil nutrient
   - Increase total herbage yield of forage stand
   - Increase the quality of the pastures/herbage nutritive value
   - Correct the physical and chemical properties of soil (first3x ½ = 1 ½ mks)

16. **Symptoms of bacterial attack in crop production** (3 x ½ = 1 ½ mks)
- wilting
-cankers
- gall formation

17. **Factors which affect the quality of silage**
   - Type of crop species used
   - Time of harvesting
   -Time taken to ensue the material (first4x ½ = 2mks)

18. **Conditions under which opportunity cost is zero**
   - No alternative resources
   - Resources are free/abundant (first 2 x ½ = lmk)

19. **Reasons of using certified seeds for planting**
   - High / 100% germination potential
   - Free from pests and diseases
   - High yields

   True to the type

   Free from contrareination e.g weeds seeds. (4x ½ = 2mks)

20 Factors affecting rooting of cutting
   -Temperature
   - Relative humidity
   - Light intensity
   - Oxygen supply
   - Chemical treatment
   - Leaf area (4 x ½ = 2 mks)

SECTION B (20MKS)

21 a) Identity
- Pig breeding records (1 x 1 = 1 mk)

b) Tools used in selection of breeding stock
- Used in culling of unproductive pigs (2 x 1 = 2 mks)

c) Importance of farm records to loaning agencies
- Shows the ability of farmers to repay back money they are seeking to be loaned. (1 x 1 = 1 mk)

22. a) naming
A- Multiple stem pruning system of coffee
B - Single stem pruning system of coffee (2 x 1 =2mks)

b) Involves capping the main stem at various heights as the coffee bush grows. At each capping the best growing sucker is allowed to continue growing upwards.
- First capping is done at 53cm
- Second capping is done at 114cm
- Final capping is done at 168cm
- The height of single stem bushes ranges between i1.5m — 1.8m. (3 x 1 = 3 mks)

23 I) **Identify**
C — couch grass (Dagitaria scalenum)
D — Double thorn (Oxygruim)

ii) Why it is difficult to control weeds
- Has underground storage organs / Rhizomes (1 x 1 = 1 mk)

iii) Three chemicals used to control weeds
- Duron
- Linuron
- 2,4- D

iv)Two harmful effects of weeds
- Causes irritation to the farm workers / labour
- Causes competition to farm crops
- Acts as alternate host for crop diseases and pests (2 x 1 = 2 mks)

24 a) **The aim of the experiment**
- Show the presence of living organisms (lxl=lmk)

b) **Results expected**
(i) E_1 lime water turns milky as living organisms respired to produce CO_2 (1 x 1 = 1 mk)
(ii)E_2 lime water remains clear as living organisms has been killed thus no respiration (1 x 1 = 1 mk)

SECTION C (40 MKS)

25 a) Five ways in which trees help in soil conservation
i)Shading of leaves
- Upon decomposition adds organic matter into the soil improving soil nutrients

ii)Reduction of force of rain drops
- Tree branches and leaves reduce the erosive force of rain drops

iii)Act as wind breaks
- Reduces the force of wind reducing wind erosion

iv) Roots of trees
- Holds soil particles together reducing soil erosion through agents of erosion.

v) Some tree species are leguminous
- Contain nitrogen fixing bacteria which fixes nitrogen improving soil fertility

(5 well explained x 1 = 5 mks)

b) **Five uses of water on the farm**
i)Domestic purposes as in washing utensils, cooking, drinking, washing clothes and cleaning the house
ii) Watering livestock, washing animals for example pigs, washing and cleaning livestock buildings and washing farm equipment's
iii) Diluting of chemicals used in controlling of pests and diseases in both crops and livestock
iv) Processing of farm produce such a coffee, carrots, beets, hedes and skins.
v) Construction of buildings for example concrete mixing
vi) For irrigating crops *(first 5 x 1 = 5 mks)*

c) **Treatment of water**
i)Filtration at the water intake
Water passes through a series of sieves of different sized mesh before entering the intake pipe
ii)Softening of water
Water flows into a mixing chamber which contains soda ash (sodium bicarbonate and alum (aluminum sulphate) soda ash softens water, while alum help to coagulate solid particles.

iii) Coagulation and sedimentation
- Tank is circular and large
- Solid particles such as silt and sand settles down
- Open to allow in fresh air into the water thus removing bad smell
- Bilharzia worms are killed when water stays in the tank for atleast 36hrs.

Filtration
- Filtration tank removes the remaining impurities such as silt and solid particles
- Has layers of different sizes of gravel and atop layer of sand
- At its bottom is a layer of large pieces of gravel followed by another layer of gravel dut of size. Another layer of gravel of fine texture. A layer of fine sand is placed on the top of fine gravel.

Chlorination

Chlorine is added in small amounts to kill diseases causing organisms! pathogens. Amounts added is on outbreak of water borne diseases.

Storage

Treated water is stored in a large tank before distribution out of bunds to unauthorized persons
Identity of the stage 5 x 1 = 5 mks)
Description of the process 5 x 2 = 5 mks) **(Total 10 mks)**

26. Maize production
i) Land preparation
- Done during the dry spell / season
- Eradicate deep rooted weeds! perennial weeds / deep cultivation
- Carry out primary cultivation using appropriate tools
- Harrow / secondary cultivation is done to a moderate tilth / appropriate tilth
- Incorporate organic manure during land preparation (4x1=4mks)

ii) Harvesting
- Maize take 3 - 9 month to be ready for harvesting
- Manually harvested by hands or by use of combine harvesters
- Direct de husking is done by where maize cobs are removed from the maize husks/cutting and stocking can be done to facilitate further drying before removing the maize cobs from the husks.
- Maize is harvested when the moisture content is about 18% (3 x 1 = 3 mks)

ii) observed while harvesting cotton

iii) Picked lints should be placed in clean containers! never use sisal bags whose fibres may mix with the lint
Never pick wet lint
Grade lint as it is picked in the field place clean lint AR (safi) in one container and BR (fisi) in another container. Avoid picking lint with contamination such as twigs, dry leaves or soil Harvesting is done in dry season (3 x 1 = 3 mks)

27 a) Transplanting of onions in the field
- Ready for transplanting after two months in the nursery
- Transplant late in the evening / during cool weather
- Thoroughly water the seedlings in the nursery bed
- Transplanted at a spacing of 30cm x 8 cm
- Holes are shallowly dug! cover roots with little soil as deep planting of seedling inhibit bulb expansion
- 250kg per hectar of double superphosphate is used
- Dig out seedlings from the nursery bed with the aid of garden trowel / ensure root systems are not damaged
- Ensure each seedling root system has a ball of soil
- Cover the roots gently with firming it at the top
- Water each seedling
- Apply mulch over the entire seed bed
- Shade individual seedlings (10 x 1 10 mks)

b) **Factors influencing spacing in crops**

i)Height
Shorter crops require narrower spacing than the taller crops

ii) Suckering / tillering
Plants that tiller or produce suckers will tend to occupy a big area and thus require wider spacing than those that do not tiller or produce suckers

(ii) **Soil fertility**

- Crops may be spaced wider if the soil is unfertile and close if the soil is very fertile

iv **Purpose of crop**

- Crops can require different spacing depending on the crops for example maize grown for silage is spaced closer than that grown for grains

v) **Soil moisture regime**

- Drier areas require wider spacing than wetter areas

v) **Spreading habits / growth habit**

- Some crops spread wide while others do not spread

vi) **Number of seed per hole**

- If more seed are planted per hole, the spacing is wider than if few seeds or no seed is planted per hole

vii) **Mechanization**

- A crop whose operation will be mechanized in spaced wider than a manually managed crop to allow space for machinery

viii) **Pure stand / inter planting crop**

- Wider spacing is required for a crop to be inter-planted than in a pure stand.

Disease and pest control

- Proper spacing is used to control certain diseases and pests e.g groundnut rosette and aphids

(well explained points l0 x 1 = 10 mks)

c) **Types of farm records kept by a diary farmer**

(i) Feeding records
Show the type of feeds and quantities given to animals at a given time

ii) Breeding records
Show details of breeding patterns for various animals on the farm! date of service / pregnancy diagnosis / expected calving date / sex of the calf / the sire.

iii) Labour records
Show details of human resources effort! show number of workers / their grades / salaries /responsibilities / performance on the farm

iv) Health records
Show incidences of disease / animal attacked / treatment given / response / control measures taken/ cost of treatment

v) Milk production records
Show the total milk yield from the hard and individual cows / the quantity of milk in terms of butter fat content is also shown for each cow on the farm

vi) Milk marketing records show the quantity of milk sold / the price per litre / kilogram / also show quantity of milk sold / price per litre / kg / also show the revenue earned from milk per given period of time / day / month / year.

viii) Inventory records show all the assets! buildings, machinery, land, livestock etc any consumable goods owned by a farmer! farm

Stating ½
Reason ½ total = 10 mks