**FORM 4 AGRICULTURE 443/1**

**PAPER ONE MARKING SCHEME**

 **DECEMBER 2021**

**END OF TERM 2 2021 EXAMINATION**

**SECTION A (30MKS)**

1. Benefits of practicing organic farming
* It is environmental friendly/ no pollution.
* It produces healthy products
* The produce fetch higher prices in the international market.
* It uses locally available material/cheap.
* It is easy to carry out.
* It is sustainable/ conserves soil.

4x1/2= 2mks

1. Reasons for preparing land early.
* To give vegetation time to dry up and decompose to organic matter.
* Allow proper gaseous exchange, thus co2 is replaced by oxygen which is necessary for germination.
* Give enough time to other subsequent operations to be done.
* Give way to early planting.

4x1/2=2mks

1. Particulars in the title deed.
* Name
* Id card number
* Signature /company seal
* Condition of ownership eg mortage for loan. 3x1/2=11/2mks
1. Ways of carrying out overhead irrigation.
* Use of sprinklers
* Use of watering cans
* Use of hose pipes.3x1/2=11/2mks
1. Indicators of well rotten compost manure
* Light weight
* Brown in colour
* Has the smell of forest soil
* Original nature of the material is not noticeable.

4x1/2=2mks

1. Advantages of rotational grazing
* Controls diseases / parasites
* Better utilization of pastures/ excess forage is conserved / sold
* Pasture is given time to regenerate.
* Allows various management practices to be carried out eg weeding.
* Ensures even distribution of animal waste.

4x1/2=2mks

1. Influence of soil pH
* Influences the type of crop to be grown in an area.
* Influence availability of plant nutrients.
* Low pH influences prevalence of certain diseases and pests eg nematodes.
* Influences the activities of soil micro-organisms in the soil.

4x1/2mks)

1. Reasons for

a) Rolling

- Prevent small seeds from being blown away by wind.

- Increase seed- soil contact. 2x1/2= 1mk

b) Levelling

 - Prevent easy germination of small seeded crops

 - Facilitate uniform germination of seeds.

 2x1/2= 1mk

1. Characteristics of variable inputs.
* They are added to fixed inputs during production.
* Are allocated to specific enterprises.
* Their cost depends on quality and quantity used.
* They change in quantity with the level of production.
* Their cost value is used to calculate gross margin of farm enterprises.

4x1/2= 2mks

1. Ways through which plant nutrients are lost
* Leaching
* Plant uptake
* Volatilization /burning (3x1/2= 11/2 mks
1. Activities carried out during hardening off.
* Gradual removal of shade.
* Gradual reduction of watering frequency
* Reduction of the amount of water used.(2x1/2=1mk
1. Types of financial books.
* Journal
* Ledger
* Cash book
* Inventory. 4x1/2= 2mks
1. Factors affecting the effectiveness of pesticides.
* Weather conditions
* Persistence of the pesticide
* Formulation of the pesticide
* Mode of action of the pesticide
* Mode of action of the pesticide.
* Concentration of the pesticide in relation to stage development.

4x1/2=2mks

1. Factors that affect the quality of silage.
* Type of forage used.
* The stage of harvesting the forge
* Moisture content of forage
* The leaf – stem ratio of forage
* Speed of ensiling
* Degree of compaction

4x1/2= 2mks)

1. Difference between

Soil texture: Fineness or coarseness of soil mineral particles while.

Soil structure: Is the arrangement of soil particles into groups or aggregates and shapes.

2x1=2mks (mark as a whole)

1. Importance of seed selection.
* Helps to obtain seeds with a high germination potential
* Reduces the chances of pest disease attack.
* Helps to obtain high quality yields.
* Makes it easy to identify seeds that are suited to a given ecological zone.

3x1/2=1 1/2mks

1. Factors that affect elasticity of demand
* Availability of substitutes.
* Degree of necessity
* Number of uses a product can be put to
* Time lag
* Promotion of a commodity
* Supply

4x1/2= 2mks

 **SECTION B(20 MKS)**

1.

|  |
| --- |
| Mr. Mukindia’s farmPROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED 2014 |
| Purchase and expenses  |  Sales and receipts |
| Opening valuation  | 12,000 | 00 | Sale of milk  | 8,000 | 00 |
| Purchase of pesticides  | 3,000 | 00 | Sale of goats | 5,000 | 00 |
| Interest payable  | 1,750 | 00 | Sale of one year heifer  | 1,000  | 00 |
| Veterinary bills  | 1,400 | 00 | Closing valuation | 16,000 | 00 |
| Wages  | 10,000 | 00 |  Total  | 30,000 | 00 |
| Depreciation of machinery  | 3,000 | 00 | Loss 31150-30000 | 1,150 | 00 |
| TOTAL | 31,150 | 00 | TOTAL | 31,150 | 00 |

 5mks

1. Diseases

a) P- Bacterial wilt (1x1=1mk)

 Q- Maize smut (1x1=1mk)

b) Causative agent

P – Bacteria ( pseudomonas solanacearum) 1x1=1mk

Q – Fungi ( ustilago maydis 1x1=1mk

c) One cultural method of controlling Q

- Crop rotation

- Field hygiene

- Rogueing

- Use of clean planting material/ certified seeds1x1=1mks.

1. a) Root pruning (1x1=1mk

b) Reasons for the activity above

* reduces root damage during transplanting
* makes lifting of seedlings easy
* Encourages the development of short, dense and strong rooting system.
* Seedlings establish faster.

Any 2x1=2mks

 c) Tools used

* Panga
* Machete 2x1=2mks
1. a) M – Trelishing (1x1= 1mk

 N- Earthing up (1X1=1mk

b) Crops managed using management. M

* passion fruits
* Some bean varieties.

 -Thorn melon 1x1=1mk

c) Reason for carrying out

M- Provide support of crops with vines using wire or sisal strings.

N- Improve tuber formation in irish potatoes.

* Provides support thus prevent lodging in maize.
* Promotes production of seeds in groundnuts.
* Improves drainage around the crop in tobacco.

Any 1x1 = 1mk

 **SECTION C (40 MKS)**

1. a) Cultural methods of weed control
* Crop rotation: controls wed that are associated with certain crops eg. Striga in maize fields.
* Cover cropping -: smoothers weeds preventing their growth.
* Flooding: controls non – aquatic weeds in rice fields.
* Timely planting: enable crops to establish earlier thus smothering weeds.
* Proper spacing: creates very little space for weed growth and forms canopies that suppress weeds.
* Clean seed bed. It starts off the crop on a clean bed to enable it to compete effectively with weeds.
* Use clean seed/ planting materials: this prevents introduction of a new weed into the farm.

**Any 5x2=10mks**

**Stating – 1mk**

**Relevant explanation – 1mk**

 **b) Negative effects of wind in crop production.**

* Result sin soil erosion/ loss of plant nutrients thus poor crop growth.
* Results in lodging of cereal crops/ breaking of branches.
* Spreading of diseases, weed seeds and pests.
* Disperses rain bearing clouds resulting into lack of rainfall.
* It encourages transpiration hence wilting.
* Destroys farm structures eg crop stores green houses etc.
* Transfers agro- chemical such as herbicides to unwanted areas during spraying.
* Accelerates the rate of evapotranspiration.
* Causes stress to crops and young livestock due to chilling caused by cold winds/frost.

Any 6x1=6mks

**c) Factors influencing depth of planting.**

**Soil type** – seeds emerge from greater depth in sandy soils that are light than in clay soils.

**Soil moisture content**: seeds are planted deeper in dry soils in order to place them in a zone with moist soil.

**Size of seed**: larger seeds are planted deeper in the soil since they have enough reserves to shoot and emerge through the soil.

**Type of germination**: seeds with epigeal type of germination e.g. beans are planted shallower than those with hypogeal type of germination.

**4x1=4mks**

1. a) Factors that encourage soil erosion.
* Lack of ground cover exposes soil to agents of soil erosion/ removal of cover crops.
* 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 water and carried away.
* Frequent cultivation / over cultivation pulvenses the soil making it easy to detach and be carried away.
* Overstocking leads to overgrazing which destroys ground cover exposing it to agents of erosion.
* High amount of rainfall increases saturation of soil with water thus increasing soil erosion.
* Cultivation of the river banks destroys river line vegetation exposing it to soil erosion agents.
* Ploughing up and down the slopes creates water channels which encourage soil erosion.
* High rainfall intensity increases impact of raindrop thus encouraging raindrop erosion.
* Burning of vegetation leaves land bare exposing it to erosion agents.
* Cultivating soil when too dry or too wet destroys soil structure making soil easily eroded.

**Any 8x1=8mks**

b) Nursery bed management practices.

* Mulching to conserve moisture
* Erection of a shade to minimize evapotranspiration.
* Weed control to reduce competition with seedlings.
* Pests and disease control to ensure healthy seedlings
* Pricking out to minimise competition.
* Watering to ensure adequate moisture supply.
* Hardening off/ removing shade/ reducing watering to acclimitise the seedlings to conditions in the field.

**Any 7x1=7mks**

**c) Harvesting of sugarcane**

* Sugarcane mature 18-20 months whereas ration take 16mths in western. In coast it takes 14months and ratoon crop take 12months.
* Samples should be taken for quality testing in the factory.
* If the quality is ok harvesting should start immediately.
* Cut the cane at the ground level to avoid loss of the yield.
* After cutting cane the green tops are removed immediately.
* The leaves should be stripped.
* Harvesting is done using a cane harvesting matchettes.
* Harvested cane should be delivered to the factory within the first 24hrs.

5x1=5mks

1. a) Characteristic of ideal agro- forestry tree species.
* Nitrogen fixing ability
* Fast growing ability
* Multipurpose in nature
* By- products production.
* Deep rooted with shallow root zone.
* Should be palatable.

6x1=6mks

 b) Establishment of cabbages under.

1. Land preparation.
* Clear the vegetation
* Plough / dig deeply to eradicate perennial weeds.
* Harrow to a medium tilth
* Prepare land during the dry season.

Any 3x1=3mks

1. Transplanting.
* Transplanting the seedlings at the age of four to six weeks
* Transplant during a cloudy or cool day.
* Water the nursery bed thoroughly before transplanting.
* Lift seedlings with a ball of soil around the roots to avoid damaging the roots.
* Water the field well before transplanting.
* Apply a handful of well decomposed organic manure or one table spoonful of DSP per hole.
* Apply suitable insecticides to control soil borne pests.
* Plant seedlings at the same depth as they were in the nursery.
* Firm the soil well around the base of the seedlings.

7x1=7mks

 c) Harvesting of bulb onions.

* Harvest after 5 months.
* Harvest when leaves start drying
* Break or bend the tops at the neck to hastern withering
* Dig out the bulbs and leave them to dry under shade.
* Turn daily to ensure uniform drying.
* Store in slated boxes.

 4x1=4mks