**MERU CENTRAL CLUSTER EXAMINATION (2020)**

 **Kenya certificate of secondary education (k.c.s.e)**

**443/1**

**AGRICULTURE**

**PAPER 1**

**MARKING SCHEME**

**AGRICULTURE PAPER 1 MARKING SCHEME**

**SECTION A (30 mks)**

1. Difference between olericulture and pomoculture

- Olericulture –Growing of flowers

- Pomoculture –growing of fruits

2 .Methods of farming

-mixed farming

-Nomadic pastoralism

-shifting farming

-Organic farming

-agro-forestry

3. Variable and fixed cost in broiler production

a)Variable cost

cost of the feed

cost of drug

b)Fixed cost

-cost of feeders and waterers

-Cost of structure/Depreciation of poultry house

 - Cost of chicks

4. Advantages of crop rotation (2mrks)

-Improve soil structure

-Control soil borne pest and diseases

-Ensure maximum utilization of farm labour (2mrks)

-Aids in weed control

-Improve soil erosion

-Security in case of failure on one crop

-Add nitrogen through N-fixation by Rhizobium bacterial when legume are included

5. Factors considered when classifying crop pests

-crop attacked /mode of felling

-whether field /storage pest/stage of attack (2mrks)

-Crop part attacked

-science classification e.g. insect mite, rodent

6 a) Name of the owner

 Size of the land

 Land title deed number

 Seal and signature of issuing officer

 Date of registration

 b) Communal land tenure

 Co-operative land tenure

 State ownership

 7. Drying

 Dusting/seed dressing

 Sorting and grading

 Processing

 Packaging

8. Refers to returns from the best alternative forgone

9. - Supervision.

 - Giving incentives

 - Training

 -Mechanisation

10. Concentration

 Weather conditions

11. -Farm boundaries

 -Homestead

 -Terraces

 -River bank/water catchment areas

 -Slopes

 -Within pasture land

12.Give four advantages of using seeds over vegetative materials. (2 Mks)

* Seeds are not bulky
* Seeds are easy to handle during planting
* Possible to mechanize operations when using seeds
* Seeds are easy to treat against soil borne pests and diseases

13.State four features that should be considered when choosing water pipes for use on the farm

 (2 Mks)

* Durability
* Strength/ability to withstand pressure
* Diameter/size of the pipe
* Workability
* colour

14..Reasons why primary cultivation should be done early before the onset of the rains.

 (1 ½ mrks)

* Give time for the soil organism to act on organic mater
* Allow gaseous exchange to take place thus carbon dioxide diffuses out of the soil .
* Allows other operations to take place in time .

15. -Fast growth

 -Fast to lot

-Leafy

 -Preferably leguminous

 -Able to grow in poor soil conditions.

**SECTION B:** (20 mrks)

16a) Cutworm / agrotis SPP.(1 mk)

 b) -Early planting. For crop to establish first (2 mks)

 - application of appropriate pesticide/insecticide/chemical to kill it.

 - field hygiene to prevent transmission from previous crop residues

c) It increases the cost of productionby buying the pesticides (2mks)

 It reduces the yield of the crops

17a) - Straight fertilizer supply one of the fertilizer elements e.g N1 P1 or K

 -Compound fertilizers supply two or three fertilizer elements.

 b) 100kg supply 20kg N

 1 hectare = 200kg C.A.N

 100kg = 20kg N

 200kg = ?

 200 x 20

 100 1

 = 40kg N

 1 ha requires 40kg N

 5 ha “ ?

 40 x 5 = 200kg N

 1

18a) Identify the disease 1 Mk)

* Maize smut
1. Name causal organism of the disease. (1 Mk)
* Fungus Ustilago
1. State three cultural methods of controlling the disease. (3 Mks)
* Crop rotation
* Field hygiene
* Use of certified seeds
* Planting resistant varieties

19. a) **Law of diminishing returns** which states that if successive units of work input are added

 to a fixed input a point is eventually reached where additional out put per addition unit of in

 put declines(2 mks)

 b) **Phase II** each additional unit of fertilizer input leads to a lower increase in total output of

 maize than the previous unit of fertilizer

 **Phase III** each additional unit of fertilizer input leads to decrease in total output of maize

 (2 mks)

1. Helps the farmer to identify the level of optimum fertilizer application in the production

of maize (1 mks)

**SECTION C (40MARKS)**

20.a) Explain five factors that should be considered in farm planning. (10 Mks)

* Environment factors
* Size of the farm
* Farmers objective and performance
* Government regulations/policy
* Availability and cost of farm inputs
* Security
* Trends in the labour market/skills
* Existing market conditions and price
* Communication and transport to ensure that produce reach markets and inputs are easily accessed.
* Possible production enterprises the farmer chooses that have low inputs with most profitable

b) Describe two transplanting of tomatoes seedling. (10 Mks)

* Should be done when seedlings are pencil size thick (one month old)
* Nursery should be watered before for ease lifting of seedlings
* Use of garden trowel to ensure that seedlings are lifted with lump of soil around roots
* Applying appropriate pesticide on the planting holes and thoroughly mix with the soil
* Lift only healthy and vigorous seedlings
* Plant one seedling per hole at the same depth as was in the nursery
* Transplanting should be done in the evening or on cloudy day
* Provide temporary shade to the transplanted seedling
* Water the seedlings as necessary
* Plan the soul around the seedling and firm
* Holes dug are placed at 60 – 100 cm by 50 – 60 cm
* Transplant onset of rain
* Transport the seedlings carefully /use a wheelbarrow
* Plant holes should be dug at 15 cm deep

21.Describe paddy rice production under the following sub-headings.

1. Land preparation (2 Mks)
* The rice field should be levelled and burels constructed around them for controlling water
* In small scale jembes are used in land preparation
1. Water control (2 Mks)
* The level of water is increased to 5 cm at planting time gradually to a height of 15 cm by the time of seedling are fully grown
* Water should be allowed to flow slowly through the fields
* If the flow of water is not possible then old water should be drained and fresh water added every 2 – 3 weeks
1. Fertilizer application (2 Mks)
* Sulphate or ammonia is applied at rate of 25 kg for each nursery unit of 18.5 m x 18.5 m before sowing.
* Double super phosphate is broadcasted in the field at the rate of 120 kg/ha before planting
* In the fields sulphate of ammonia is applied as a rate of 125 kg/ha before transplanting and 125 kg/ha about 4 days after transplanting.
1. -Weed control (2 Mks)

- Weeds are controlled by the flooding

Use appropriate britachlor to control a few weeds

b) Explain how each of the properties of rainfall and light influence crop production.

i) Rainfall (4 Mks)

* Rainfall reliability :Determines timing of land preparation and planting
* Amount of rainfall: Determines the type of crop to grow
* Rainfall distribution: Influences the type and variety of crops to grow in an area
* Rainfall intensity: High rainfall intensity damages crops and causes soil erosion

ii) Light (4 Mks)

* light intensity : the rate of photosynthesis increases with increase in light intensity
* Light duration: It determines the flowering hence the type of crop to grow i.e short day, long day or day neutral plants
* Light wavelength: Plants absorb light of specific wavelength making natural light more suitable for crop production

c)

- 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 them 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 fertile and well drained

- Previous cropping. Avoid area where same crop family had been planted to avoid pest and disease attack/build up

- Near the seedbed/main field to minimize damage to seedlings during transplanting

- Accessibility for ease of movement

- Away from shading effect to allow sunshine

22a) Six advantages of rotational grazing (6mrks)

* The livestock make maximum efficient use of pasture.
* It reduces the buildup of pest and diseases.
* Animals waste is distributed evenly in all paddock or field
* Excess pasture can be harvested and conserved
* It is possible to apply fertilizers and control weeds , pest and diseases in the pasture that are not in use
* It allows a resting period for the pasture to regenerate before been grazed on again (6mrks)

b) Eighty ways in which soil fertility can be maintained. (8mrk)

-adding manure to the soil to enrich it with nutrients.

-using inorganic fertilizers which releases nutrients in forms that are readily available to plants.

-practicing crop rotational to ensure balanced nutrients use.

-using appropriate tillage, for instance minimum tillage.

-regulating soil ph though liming

-controlling soil erosion

-practicing a forestation and reforestation

-By irrigation which increases availability and uptake of plant nutrients and reclaims saline soil

-through mulching

-By weeding to reduce competition for nutrients.

-By practicing inter cropping preferably with legume to enhance nitrogen fixation.

c) Six reasons for pruning coffee (6mrks)

-To train the plant so that it can have the required shape

-To remove the diseased and the unwanted parts of a plant such as extra suckers ,leaves ,branches ,flowers or even stems

-To control cropping

-To facilitate picking to ease penetration of the s pray

-To control pest and diseases.