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**AGRICULTURE FORM 4**

**PAPER 1**

**TRIAL 2, 2019**

**MARKING SCHEME**

1. Field management for optimum plant population
* Gapping
* Thinning ( 2 x½=1mk)
1. Factors that characterize small scale farming
* Requires small piece of land
* Low capital investment
* Low yields
* Simple farm tools /equipment’s ( 2 x ½=1mk)
1. a) Metal pipes
* Galvanized iron pipes
* Alluminum pipes ( 1 x ½mk)

b) Hose pipes

* Rubber hose pipe
* Plastic hose pipe ( 1 x ½mk)
1. Forms Horticulture practices
* Pomology /pomo-culture
* Olericulture
* Floriculture ( 3 x½=1½mks)
1. Disadvantages of growing one crop on a piece of continuously
* Build up pest and disease
* Build up weeds
* depletion of minerals specific to the crop
* Destroys soil structure ( 4 x ½=2mks)
1. Qualities of a good mother plant for vegetative propagation
* Healthy /free diseases/pests
* Tolerance to salinity
* Compatible to variety of scion
* numerous root system
* High yielding
* Production of quality products
* vigorous /fast growing (4 x ½=2mks)
1. – alternating different families of crops, makes it easy to control /remove the weeds
* Weeds specific to certain crops are easily controlled by alternating the crops of different type eg. strigaspecific to grass.
* Alternating difficult to weed crops with easy to weeds-maker it easily to control weeds

 (2 x ½==1mk)

1. Reasons for imposing quarantine on planting materials
* Prevent introduction weeds
* Prevent introduction of pests and diseases from other countries ( 2 x½=1mk)
1. Mechanical method of separating soil particles

Sieving using sieves of different sizes

* Dissolving soil in jar of water, shaking and allowing it to settle down ( 2 x ½=1mk)
1. Settlement schemes in Kenya as result of success of million acre
* Jet schemes
* Harakaschemes
* Shirikaschemes
* Larisettlement schemes
* Squatters’ settlement schemes
* Z -plots
* Harambee schemes
* Olkalou salient scheme (4 x ½=2mks)
1. Practices which encourages soil erosion
* Overstocking
* Burning vegetation cover
* deforestation
* Planting annual crops on steep slopes
* Ploughing up and down the slope
* Clean weeding leaving the land unprotected. ( 3 x ½=1½mk)
1. Characteristics of good vegetable seedling
* Free from pests and disease
* Vigorous growth
* Free from physical deformities
* Correct stage of growth/height 10-15cm, 4-6 true leaves ( 4 x ½=2mk)
1. Posts –Harvest practices
* Drying
* Dusting /seed dressing
* Sorting and grading
* Processing
* Packing ( 4 x ½=2mk)
1. Environmental factors affecting crop production
* Rainfall
* Temperatures
* Wind
* Soil type ( 4 x ½=2mk)
1. Reasons for seed selection
* High quality
* High yield
* High germination rate
* To reduce chances of disease/pest attackCrops / avoid spread of weeds
* Seeds that can grow in specific area ( 4 x ½=2mk)
1. Benefits of top dressing grass pasture
* Replenish the soil nutrients
* High herbage yields
* High herbage nutritive value
* Improve chemical and physical condition of the soil
* Enable microbial to break organic matter ( 2 x ½=1mk)
1. Disadvantages of communal land tenure system
* Difficult to control pest/parasites/disease
* No incentive to conserve land
* Difficult to make sound farm plan
* Difficult to control breeding in livestock
* Land disputes are common
* An individual cannot use land to get loan ( 4 x ½mk)
1. Benefits of correct plant population
* Obtain high quality crop
* Obtain high yields
* Help the farmer to control soil erosion/ soil and water conservation ( 2 x ½=1mk)
1. – Opportunity cost is the value of foregone best alternative/revenue as result of choosing the best alternative. ( 1 x 1=1mk)
2. Details of tittle deed
* Name of owner
* Size of land
* Land parcel number/location
* Type of ownerships
* Kind of right of owning land
* Seal of issuing officer
* Date of registration
* Signature of issuing officer/name of officer ( 4 x ½=2mk)

**SECTION B (20MKS)**

1. a) Sample S1 (1 x 1=1mk)

b) Sample S8 (1 x 1=1mk)

c) – Application of lime

 - Application of basic fertilizer (2 x 1=2mks)

d) Sample S3 ( 1 x 1=1mk)

1. a) Chitting/sprouting ( 1 x 1=1mk)

b) – Arrange seed potato in layers of 2/3 deep in partially dark room

- Arrange the seeds with rose and facing upwards and heel end downwards

* Allow diffused light through. ( 3 x 1=3mks)
1. a) Weed A – Couch grass /*Digitariascalarum*

Weed B – Wondering jew/*Commelinaspp*

Weed C – Nut grass / *Cyperusrotundus* ( 3 x 1=3mks)

b) – Underground rhizomes/structure

- Ability to propagate vegetatively ( 1 x 1=1mk)

c) – Livestock feed

- Vegetable for human beings ( 1 x 1=1mk)

1. a) – Tethering x1x1 (1mk)

b) – Few animals can be reared by this method

- Animal can strangle itself to death (2 x 1=2mks

1. a) Squirrel ( 1 x 1=1mk)

b) Planting time (1 x 1=1mk)

c) Unearth seeds/eat reducing the plant population (1 x 1=1mk)

**SECTION C (40MKS)**

1. a) Influence of Biotic factor on crop production
* Pest – They feed on part /whole plant reducing the yields

Transmit diseases to crops

* Parasites – Transmit diseases to livestock / suck blood leading to anaemia
* Decomposers – Break down organ matter releasing nutrients to plant
* Pathogens – Transmit diseases to crops and livestock
* Predators – They kill other animals/some eat pest reducing population.
* Pollinators – transfer pollen grains from plant to plant causing pollination and fertilization.
* Nitrogen fixing bacteria – convert atmospheric nitrogen to nitrate –making it available to plant

Stating 5 x =5mks

Explaining 5x1=5mks

b) How Government policy improves Agricultural production

* Land reform policy to enable improve land ownership
* Provision of extension services/education
* Help control parasites/diseases and weeds effectively
* Provision of storage facilities for bulky commodities
* Establish openers to supply inputs and market Agricultural goods.
* Provide subsidies on Agricultural inputs
* Impose high taxation on imports to protect local Agricultural products
* Improve laws toregulate quality of Agriculture
* Facilitate conservation of naturalresources
* Establish national food security ( 4 x 1=4mks)

c) Properties of nitrogenous fertilizers

* They are highly soluble in soil water
* They are easily leached to lower horizons
* They have short residual effect hence need frequent application
* They are highly volatile, they should be applied on moist soil
* They have burning effect, they burn the vegetation part, they should not come into contact with green part.
* They are hygroscopic they absorb atmosphericvapour and cake
* They are highly corrosive, they burn the epithelial cells of palm

(6 clearly explain/deserved one mark) (6 x 1=6mks)

 Note: The underlined is a must to score.

d) Importance of irrigation

* Improves crops yields
* Ensure steady supply of food throughout the year
* Maximum utilization of resources where the soil is fertile
* Reclamation of arid/semi-arid areas/land
* Provide regular and adequate supply of water
* Source of employment in areas where it is used extensively
* Promote crop production for export
* Allow growing of paddy rice
* Allow growing of crops in green houses (5 x 1=5mks)
1. a) Effects of pests on beans
* Some pests transmit disease e.gaphids
* Some pest eat growing points causing stunted growth
* Some pests eats pods/fruit lowering the quality/quantity of crop
* Some pest eats roots, damage/causing wilting
* Some pests injure the plant causing wound which allow germs to enter the plant
* Some pests eat the seeds in the soil reducing plant population.
* Some insect toxic substances into the plant resulting ……growth (4 x 1=4mks)

b) i) Production of cabbage

**Seedbed preparation**

* Prepare the land during dry period
* Clear the vegetation
* Remove the stumps
* dig deeply to remove perennial weeds
* harrow the land to medium tilth ( 3 x 1=3mks)

ii) Transplanting

* Transplant at the onset of rain
* Transplant seedlings are 1 month old 10-15cm /Have 4-6 true leaves
* Select healthy seedlings
* Select vigorous growing seedlings
* Dig transplanting holes 60cm by 60cm
* Use phosphate fertilizer
* Water the nursery before uprooting the seedlings
* Use garden trowel/ uproot seedlings with ball of soil round the root zone to avoid damage
* Place the seedlings in the hole and fill with soil up the level of soil in the nursery
* Firm the soil around the base of seeding
* Put shade if necessary ( 4 x 1=4mks)

c) Nursery management cabbage seedling in the nursery

* Water nursery frequently, with enough water morning an evening
* Uproot the weeds to avoid nutrients competition
* Control pest by use of appropriate pesticide
* Erect a shade to prevent sunlight from scorching the seedlings
* Control diseases by use of appropriate fungicides
* Carrying out thinning to avoid competition for nutrients
* Remove the much as seeds start germinating ( 5 x 1=5mks)

Clearly explained to score

d) Treating water to remove solid impurities

* Filtration at the intake, water passes through series of sieves to remove solid particles.
* coagulation and sedimentation
* Allum is added to coagulate solid particles to settle down
* Filtrating tank-water passes through tank lined with different types of sand to remove the remaining solid particles ( 4 x 1=4mks)
1. a) – Grass cover reduces the speed of run off which lowers the erosive power of run-off
* Grass cover reduces/intercepts the impact of raindrops which reduces splash erosion
* Grass cover protects soil surface hence reducing wind erosions
* Grass roots hold soil particles together from being carried always by erosion agents.
* Grass cover reduces speed of run-off there by increases infiltration of water
* Organic matter from grass improves soil structure which improves infiltration rate of water, hence reducing erosive power of run-off ( 5 x 1=5mks)

NB/must be explanations not stating

b) i) – Clear land and remove stumps

* Remove all the perennial weeds/plough/dig in dry seasons
* Carry out secondary cultivation
* Harrow to medium tilth ( 3 x 1=3mks)

ii) Select suitable maize variety to the environment.

* Dig holes 2.5cm -10cm deep depending on soil moisture
* Digat spacing 23-50cm x 75-90cm apart
* Apply phosphate fertilizer
* Apply phosphate fertilizer at 120kg/hectare
* Place 2 seeds per hole
* Plant certified /healthy seeds ( 6 x 1=6mks)

iii)- Gapping

* Thinning
* Control weeds by use of appropriate method
* Top dress using nitrogenous fertilizer
* Apply nitrogenous fertilizer at height of 40-60cm /knee high
* Apply 200kg of nitrogen per hectare
* Control stalk borer by use of appropriate pesticides
* Control disease by use of appropriate fungicides ( 6 x 1=6mks)