AGRICULTURE

FORM 4

PAPER 1AGRICULTURE

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PAPER 1

MARKING SCHEME

443/1

SECTION A

1.Methods of applying fertilizers.

- Broadcasting
- Hole/furrow placement method.
- Side dressing/ring/band application
- Foliar/fatigation spraying
- Drip application

2. Burning vegetation

- Volatilizes/lose of some nutrients.
- Destruction of organic matter.
- Exposes the soil to agents of soil erosion
- Kill useful soil microorganisms.
- Soil moisture evaporates
- Ash formed creates nutrients imbalance

3. Disadvantages of communal land tenure

- Poor stock breeding programme
- Overstocking may lead to soil erosion
- No incentives to improve land
- No incentive to put up permanent structures for long term investment.
- Low production
- Difficult to control of diseases, pests and parasites.

4. Importance of drainage improvement

- Increase soil volume
- Raise the soil temperature
- Improve soil aeration
- Increase the activity of micro-organisms.
- To reduce soil erosion
- Remove toxic substances in the soil.

5 Features of rainfall

- Distribution of rainfall
- Reliability of rainfall
- Intensity of rainfall
- amount of rainfall

6. Optimum plant population

- Thinning
- Gapping

7. Green manure plants

- High nitrogen content/legume plants
- Fast growing
- Capable of rotting quickly
- Highly leafy/vegetative.
- Should be hardy

8. Soil texture analysis methods

- Sieving
- Sedimentation/Dispersion in water

9. State of harvesting crops

- Purpose /use of the crop
- Attainment of the required chemical concentration /standards
- Market demand
- Prevailing weather conditions
- Market prices/profit margins

10. Competitive ability of weeds

- Some produce large quantities of seeds
- Weeds seeds remain viable in the soil for a long time
- Easy and successful dispersal method
- Some propagate both through seeds and vegetatively
- Can survive under unfavourable conditions/hardy
- Some complete their life cycle within a short time
- Some have elaborate/extensive root system.

11. Quality of hay

- Stage of harvesting of the forage crop.
- Storage structure conditions
- Species of the forage crop
- Length of drying period
- Prevailing weather conditions during drying

12. Insects pests.

a)Piercing and sucking

- Aphids
- Scales
- Mealy bugs
- Thrips
- Cotton seed bugs
- White flies

b)Biting and chewing

- locusts
- cutworms
- stalk borers
- army worms
- boll worms
- Crickets
- Sow fly

13. Olericulture and Pomoculture

Olericulture is growing of vegetables while pomoculture is growing of fruits.
(mark as whole)

14. Lowering soil acidity

- Application of lime
- Application of basic fertilizer

15. Making a farm plan

- Size of the farm
- Environmental factors.
- Current trends in labour market.
- Possible production enterprises.
- Farmers objectives and preferences
- Existing market conditions/price trends.
- Availability and cost of farm inputs.
- Government regulation/policy.
- Transport and communication facilities.
- Expected returns

16. Improving labour productivity

- Labour supervision
- Giving incentives
- Training
- Better remuneration
- Providing farming machines/mechanization.

- Use better tools and equipments
- Assigning specific tasks to individuals

17. Signs of viral infections
- Rosetting
- Chlorosis of the leaves
- Malformations /Distortions e.g. galls
- Curling/rolling of leaves
- Mosaics
- Streaks

SECTION B

18.a)Drip/trickle irrigation `

b)Advantages of drip irrigation
- economical in water use
- less fungal diseases on the leaves
- less weed between crop rows
- Water under low pressure can be used.
- Can be used in application of soluble fertilizers.

19. PEST Q
- American bollworm

Control
- Spray appropriate pesticides
- Hand picking and physical killing

20. a)Name of weed – couch grass/digetaria scalarum
b)The weed has rhizomes/deep underground stems which develop shoots and roots
c) Systemic/ translocated herbicide
d) Narrow leaved weed

21. a)Soil type
- x- sandy soil
- y- loamy soil
- z – clayey soil

b) - water holding/retention capacity

- porosity/drainage

22. a)It contains only two of the primary macro-nutrients

b) Nitrogen N = $\frac{18}{100}$ x 50kg = 9 kg

P_2O_5 = $\frac{46}{100}$ x 50kg = 23kg

c)The fertilizer contains phosphorus needed for root development.

SECTION C

23. A)Advantages of crop rotation

i)Improves soil fertility
- legumes improve soil fertility through nitrogen fixation

ii) Control of pests/diseases
- The life cycle of certain pests and diseases is disrupted by crop rotation

iii) Control of weeds
- Control specific weeds to certain crops e.g. striga weed in maize fields
- Cover crops smoother weeds

iv) Maximum utilization of soil nutrients
- different crops require different nutrients
- crops having different root system
- utilize nutrients from different soil depth.

v) Control of soil erosion
- cover crops incorporated in a crop rotation control soil erosion.

vi)Improves soil structure
- roots of grass leys bind soil particles together .

(stating 5 x 1mk = 5 mks+
(Explanation 5 x 1 mk = 5 mks)

b) Factors influencing crop spacing

i)Growth habit of the crop
- Tillering, spreading and tall crops require wider spacing than those which do not

ii) Purpose/use of the crop
- Crops grown for fodder/green manure fodder is closely spaced than maize for grains

iii) The type of machinery to be used.
- Where machines are to be used the crops to widely spaced compared to where no machines are to be used.

iv) Soil fertility
- In fertile soils, close spacing can be done while in less fertile soil wider spacing is done.

v) Soil moisture content
- In high soil moisture close spacing can be done while in less soil moisture slightly wider spacing is done.

vi)Pests and diseases control
- pests find it difficult from one crop to next if correctly spaced.
- Fungal diseases spread fast is closely spaced crops.

vii) Interplanted crops

Wider spacing is required for crops grown in mixed stands compared to those grown in pure stands..

(Stating 5 x 1mk = 5 mks+
(Explanation 5 x 1 mk = 5 mks)

24.a) precautions in cotton harvesting
- Avoid putting harvested cotton lint in sisal or gunny bags due to their fibres which causes ginning problems
- Hands should be clean to avoid staining of the lint.
- Avoid picking wet cotton to prevent sticking of the lint.
- Use clean harvesting containers.
- Put the different grades AR(safi) and BR(fifi) in different containers.
- Avoid twigs and leaves on harvested cotton.
- Picking should be done immediately the bolls open to prevent them from staining with dirt /dust. (1×4=4mks)

b)Management for seedlings in a nursery.
- Mulching to conserve moisture .
- Removing mulch immediately seedlings emerge
- Providing shade to minimize evaporation
- Weed control to reduce competition for nutrients, light and space.
- Pests and diseases control for healthy and vigorous growth.
- Pricking out/thinning to minimize competition for growth elements.
- Watering for adequate moisture supply.
- Hardening off the seedlings. (1×6=6mks)

c. Uses of farm records.

-Records help compare the performance of different enterprises.

-They show the history of the farm.
-Guide a farmer in planning and budgeting of farm operations.
-Help to detect losses or theft on the farm.
-Help in assessment of income tax to avoid over or under taxation.
-Help to determine the value of the farm
-Make it easy to share profits and losses in partnerships.
-Help in settling disputes among heirs to the estate when a farmer dies without leaving a will.
-Records help to show whether the farm business is making profits or losses. The information may help in obtaining credit.
-Help in support insurance claims on death,theft and fire of farm assets.
-Provide labour information like terminal benefits for like NSSF dues.(1×10=10mks)

25. a)Soil erosion by water.

i)Splash erosion/rain drop erosion
- Rain drops hit the soil surfaces whose impact displaces soil particles

ii) Sheet erosion
- Surface flow of water removes thin layers of soil from flat or gently sloping land.

iii) Rill erosion
- Water flowing down the slope removes soil in small channels or streamlets

iv) Gully erosion
- Small channels gradually develop to form deeper and wider channels due to high speed of runoff.

v) Riverbank erosion
- Riverbanks are damage by water mainly as a result of heavy downpour upstream. .

(Stating 4 x 1mk = 4mks)
(Description 4 x 1mk = 4mks)

b) Effects of low level of education and technology
- poor timing of routine practices
- lack of appropriate skills and knowledge
- low quality farm produce.
- Poor decision making in crop and livestock management practices
- Delayed adoption of modern production technology.
- Incorrect methods of application.
- Incorrect inputs and amounts. (4x 1mk = 4 mks)

c)Production maize

i)Seedbed preparation
- Early seedbed preparation before the rains
- Land clearing may be done. e.g. slashing
- Carry out primary cultivation.
- Dig deeply to remove underground structures.
- Harrow the land to moderate tilth.

(3 x 1mk) = 3 mks)

ii) Planting maize

- Planting on the onset of the rains
- Dry planting in areas with short rainy season may be done.
- Planting at the depth of 2.5 – 10cm
- Place 1 – 2 seeds per hole
- Spacing 75-90cm by 20-30cm.
- Plant manually or by use of tractor drawn planters. (5 x 1mk = 5 mks)