**Term 1 – 2023- OPENER**

**AGRICULTURE (443/1)**

**PAPER 1**

**FORM FOUR (4)**

**TIME: 2 HOURS**

**MARKING SCHEME**

**Section A**

1. **Name two situations under which irrigation is practiced (1mk)**

* During dry weather conditions and arid areas
* When growing paddy rice, which requires flooded seedbed
* To supplement rainfall
* To moderate temperature when it’s too hot

2. **Give a reason why ranching is an improvised pastoral nomadism (1mk)**

* Animals are enclosed in an area where management practice such as disease control, improved pastures, supplementary feeding and water are provided.

3. **State two ways by which a soil of PH 3 can be raised to a PH of 6 (1mk)**

* Application of lime
* Application of basic fertilizer

4. **Outline two effects of adding organic matter to sandy soil (1mk)**

* It increases water holding capacities of the soil
* It improves soil structure
* It buffers soil PH
* It improves soil fertility by releasing wide range of nutrients into the soil
* Humus which is mostly dark in color.

5. **State two causes of forking in carrots** 2x ½= 1mark

Conditions of heavy soils

- A lot of undecomposed organic matter /manure in the soil

6. **Disadvantages of hydram pumps**

-Pumps only stationery water;

-Pumps little quantities of water (2x ½= 1mark)

7. **Give four conditions that necessitate clearing of land. (4 x ½ =2 marks)**

-When opening up virgin land

- Where a stalk growing crop was previously planted.

-Where the interval between primary and secondary cultivation is long.

-Where the land was left fallow for a long time. 4 × ½ = 2 mark

8. **State four factors that determine the depth of planting (2marks)**

* soil type
* Seed size
* Soil moisture content
* Type of germination
* Ecological condition of the area

9. **State four minimum tillage practices (2marks)**

* Application of herbicides in controlling weed
* Use mulch on the soil surface
* Establishing cover crop on the field
* Timing cultivation
* Restricting cultivation to the area where seeds are to be planted

10. **State two methods of harvesting maize (1x1=1 mark**)

By removing the cobs from the stalk

By combine harvester

11. **Give four farming practices that may help in achieving minimum tillage. (4x ½ =2 marks)**

-Mulching

-Slashing

- Use of herbicides

- Planting cover crops to smoother weeds as well to conserve moisture

-Cultivating where plant is planted

- Cultivating when about to harvest a crop and then plant another crop without having to cultivate

12. Plant population = Area of land x seed rate

Spacing of crop

* Formula – ½ mrk

=64 plants

* Calculation – 1 mrk)
* Answer – ½ mrk (2mks) = 160 x 40 = 6400 plant

13**. State four reasons for conserving forage (2marks)**

* To provide feed on the dry season
* To ensure better and fully utilization of available land
* To distribute available forage for stock throughout the year
* On large scale conserved forage can be sold i.e baled bay.

14. **Give four benefits of a land title deed (2mks)**

* Can be used to secure credit facility
* Security of tenure
* Occupant can lease land and get extra income
* Encourages investment in long term and permanent projects.
* Disputes concerning land boundaries or land ownership.

15. **State four steps of gully formation (2mks)**

* movement of water from water shades
* Channel erosion caused by flowing water
* Wearing of the sides of the channels
* Scouring of the floor of channel moving water

16. **State two characteristics of a good root stock for grafting (1mk)**

* Health and free from pests and diseases
* Compatible with different scions
* Resistant to soil borne pests and diseases
* Adaptability of different soil conditions

17. **State two main causes of silage loses (1mk)**

* surface spoilage
* seepage losses
* gaseous losses

18. **State four aims of land settlement programmes in Kenya (2mks)**

To settle the landless citizens

* To relieve population pressure in densely populated areas
* Land reclamation especially by creating tsetse fly barriers
* To create self-employment thus improving living standards
* To improve or increase agricultural productivity by farming on land that was previously unused

19. **Give two factors that influence the stage at which crop is harvested (1mks)**

* Stage of maturity of the crop (concentration of required chemicals)
* Use of the crop
* Taste and preferences of the consumers
* Weather conditions, hence liability of spoilage moisture.
* Market demand
* Profit margin

**SECTION B (20Mks)**

**20. (a) Soils in each of the funnels**

H – Sand (1mk)

J – Loamy (1mk)

K – Clay (1mk)

**(b) Soil with the highest porosity**

H / Sand soil (½ mk)

**(c) Suitable soil for planting paddy rice**

K / Clay soil ( ½mk)

21. **The diagrams below represent some varieties of Sorghum crop. Study them carefully and answer the questions that follow**.

1. A= Compact panicle (1mk)

B= Open Panicle (1mk)

C= Goose necked Panicle (1mk)

1. Varieties C- Goose necked panicle makes it difficult for birds to feed on the grains
2. (i) Sorghum shootfly (Antherigonavaria)

(ii) - early planting

* + Closed season
  + Spraying/dusting appropriate
  + Insecticides

**22. (I) Name the farming practice illustrated above.(1marks)**

Chitting/ sprouting/shooting/ breaking dormancy in potato setts.

**(ii) State the procedure followed to carry out the practice you have named in (i) above (3marks**)

-. Potato setts of about 3-6cm in diameter are selected.

-look for a partially darkened room.

- Arrange the potato setts in layers of 2or 3 tubers with the rose-end facing upwards and heel end downwards.

- Diffused light is then passed through.

**(iii) State the importance of the carrying out the farming practice. (1 mark)**

Leads to sprouting of the potato setts hence grow/ mature faster when grown in the seed bed

Gives them a head start.

**23. Identify of weeds J, and K.**

E- Thorn apple – *Daturastramonium*

F- Double thorn – *Oxygeriumsinuatum*

(2 = 2 marks)

**b) Effects of weed labeled j to livestock**

It is very poisonous to livestock (1 x 1 = 1 mark)

**c) Reason why it is difficult to control weed L**

Because it has well developed underground rhizomes (1 x 1 = 1 mark)

**SECTION C (40Mks)**

**24. Production of onion**

A. (1). Ecological requirements

1. Altitude above 300m above sea level ,optimum 2100m
2. Temperature 13 to 29OC
3. Rainfall over 1000mmwell distributed throughout the growing period .Otherwise irrigate
4. Soils-Fertile and well drained soils (3 Marks)

(II).**Planting**

Crops can be sown directly into the main field or started off in a nursery bed

.Direct seeding method

1. Drilling seeds in rows 30cm apart and 10 to 15 cm within the row
2. Seeding rate for direct seedlings is 7 to 11 kg/ha

Transplanting method

1. Select a suitable site which is well drained
2. Dig deeply and remove all perennial weeds
3. Harrow to a fine filth
4. Mix soil well with rotten manure
5. Level the nursery using a rake
6. Sow the seeds in drills 13mm deep
7. Cover seeds lightly with soil and watch
8. Transplant at age of 8 weeks or thickness of a pencil
9. Spacing 30 to 38 cm x 10 to 15 cm
10. Apply DSP fertilizer in drills at the rate of 250 kg / ha
11. Trim roots and some leaves to regulate growth (5 Marks)

(III)**Field management practices**

* Thinning
* Weeding
* Top dressing using CAN
* Pest control
* Disease control

(IV)**Harvesting and marketing**

* Harvested at green stage or dry bulbs
* Harvesting done / start when leaves stale drying, the crops should be broken or bend at the neck to hasten withering of stem
* Harvesting can be done manually or mechanized
* Bulbs should be dried in the sun and outer skin peeled off ready for storage
* Grading may be done to small medium and large according to market tastes
* Separate the damaged onions or the thick -necked onions to avoid rotting
* Store onions in well ventilated area / place
* Market according to size and the size of the net bags (5 marks)

**B) Five safety measures**

i) Avoid herbicide drift to unintended crops avoid spraying on windy day

ii) Avoid contaminating animal feeds and water with chemicals

iii) Avoid spilling herbicides on pasture or fodder

iv) Left- overs and empty containers must be properly disposed

v) Spraying equipment must not be washed at water sources.

vi) Chemicals must be stored in safe places out of reach of children

vii) Equipment used in spraying herbicides must be thoroughly washed.

(1x5 = 5mks)

25.a**) Uses of farm records**

* Guide farmer in planning and budgeting
* Show whether farmer is marking profit or losses
* Show history of the farm
* Determine farmer’s credit worthiness
* Help in sharing profit, bonuses or losses in partnership or co-operative basis
* Comparing performance of different enterprises in the farm
* Helps in settling disputes among heirs.
* Help in supporting insurance claims in the event of death (8 x 1 = 8)
* Remind farmer his/her debts or liabilities
* Help in selection of breeding stock and culling
* Detect theft or loss cases on the farm
* Used in making management decisions
* Pinpointing the weaknesses of the farm business or areas
* Accurate assessment of income tax to avoid over taxation or under taxation.

**b ) Outline the harvesting of coffee under following subheadings**

* **i) Stage of harvesting** (2marks)

– Should start four years after planting

– Harvesting should be done when berries are ripe

* **ii) Procedure of harvesting** ( 5marks)

– picking of ripe berries

– picking is done by hand

– picking should be done selectively

– hooked sticks should be used to bend tall branches

- Care should be taken not to break the branches

**iii) precautions when harvesting (3marks)**

- Only ripe berries should be picked

- green and dry berries picked be sorted out

- ripe berries should be delivered to factory same day

**c. Precautions**

**\**use woven baskets to avoid premature fermentation of flowers

-handle flowers carefully to avoid damage

-don’t pick wet flowers

-avoid any contaminations

-dry flowers immediately after picking to a moisture content of 10-12 % to prevent fermentation

Flowers should not be compacted in the basket

**26 a.**  **Cultural methods of controlling weeds.**

i) Use of cover crop / live mulch:- which form a canopy over the base smothering the weeds

ii) Crop rotation – to break the cycle of specific weeds associated with some crops e.g. blackjack, wild oat on cereals

iii) Mulching – Covers the ground smothering weeds especially inorganic mulch

iv) Flooding:- The growth of non-aquatic weeds is completely discouraged in flooded fields.

v) Timely planting: If planted on time, the crops will establish faster before weeds germinate

1mk for mentioning method 1mk for brief description 2mks each for any 5 Total 10 mks

* Marks

**b. Advantages of land consolidation and registration**

* Reduces land ownership disputes
* Full prone of land ownership proper supervision of land
* Economic use of time and save on transport cost
* Easy provision of Agricultural advice
* Sound farm planning and adoption of crop rotation programme. (8marks)
* Facilitates soil conservation and land improvement
* Facilitates soil conservation and land improvement
* Facilitates construction of permanent structures
* Weed, pest and disease control is enhanced
* Incentive to the farmer
* Used as security when securing loans

c. **Objectives of land return in Kenya**

* Encourage land improvement and conservation measures
* Promote commercial farming
* Encourage investment in Agriculture (7marks)
* Enable Agriculture meet changing market demands
* Increase productivity of labour and land by putting idle land into use
* Enhance utilization of land and hence increase Agricultural out put
* Settle landless people