

IDEAL RELEASE VOLUME 1

REVISION

AGRICULTURE

PAPER 1

10 Sample Papers + Answers

By: Dennis W. Kagonia

Produced and Marketed By;

Idealprice Consultants,

P.O. Box 15339-00100,

Nairobi.

Tel: 0716 41 39 41

Email: idealpricedirector@gmail.com

SAMPLE PAPER 1

SECTION A (30MARKS)

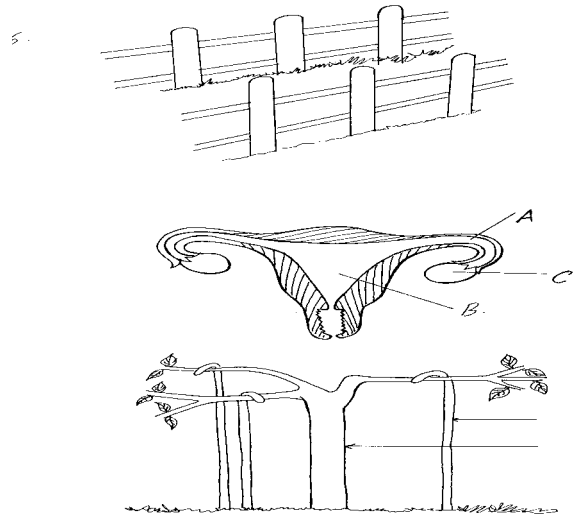
ANSWER ALL QUESTIONS

1. List down two processes of weathering (2mks)
2. Give two characteristics of a perfect market (2mks)
3. Differentiate between afforestation and re-afforestation (2mks)
4. (a) Define the term tissue culture (1mk)
(b) Outline two benefits of tissue culture to a farmer (2mks)
5. State two ways a government can minimise risks and uncertainties (2mks)
6. List two disadvantages of shifting cultivation (2mks)
7. (a) Define broadcasting as a method of planting (1mk)
(b) List two advantages of row planting (2mks)
8. (a) What is multi-storey cropping? (1mk)
(b) State two benefits of multi-storey cropping (2mks)
9. (a) What is a co-operative? (1mk)
(b) Outline three functions of a farmers co-operative (3mks)
10. (a) Name four structures that can be used to store water in a farm (2mks)
(b) Enumerate two reasons why water treatment is important in a farm (2mks)
11. (a) Define the term mulching (1mk)
(b) List two importances of mulching (2mks)

SECTION B (20MARKS)

ANSWER ALL QUESTIONS

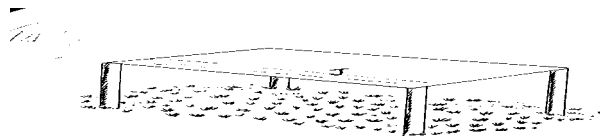
12. The diagram below shows a method of pruning in tea production. Use it to answer the questions that follow.



Tea plant

Peg

- (a) Identify the method shown in the diagram (1mk)
 - (b) Outline the procedure of carrying out the method on a tea bush (4mks)
 - (c) State two precautions that must be observed when plucking tea leaves (2mks)
13. (a) Outline two characteristics of annual weeds (1mk)
- (b) Enumerate two effects of water hyacinth in agriculture (2mks)
 - (c) Outline two limitations of legislative weed control method (1mk)
14. Below is a diagram of a nursery for raising the seedlings.



- (a) State two advantages of having the part labeled J (2mks)
- (b) State any 3 management practices that should be carried out on the nursery from the time seedlings emerge to the stage of transplanting (3mks)

15. (a) What is marginal rate of substitution (1mk)
(b) A farmer using 60kg of maize grain and 40kg of wheat decides to change to 50kg of maize grain and 47kg of wheat to prepare a ration, calculate the marginal rate of substitution (3mks)

QUESTION C (40 MARKS)

ANSWER ANY TWO QUESTIONS

16. (a) Discuss marketing functions (10mks)
(b) Discuss problems of marketing agricultural produce (10mks)
17. Describe the production of tomatoes (*Lycopersicon esculentum*) under the following subheadings.
- (a) Ecological requirements (4mks)
 - (b) Nursery establishment (4mks)
 - (c) Transplanting (4mks)
 - (d) Seed bed preparation (4mks)
 - e) Field management practices (4mks)
18. (a) Explain 10 uses of farm records (10mks)
(b) KATO farm intends to increase its dairy herd from 2 to 4 cows. Considering the following specifications, determine whether the change is profitable.
- The acreage under maize is reduced by one hectare to cater for the extra two cows. Each cow requires the purchases of a replacement heifer each year at Kshs. 3500, while the cull price per cow is Ksh. 2500.
 - Milk yield for each cow is 3500kg per cow per year, price of milk is Ksh. 25 per kg.
 - Each cow gives birth to a calf worth Ksh. 5000 every year.
 - Veterinary service charge per cow is Ksh. 600, while the cost of concentrates and minerals per cow is Ksh. 1500 per year.
 - The seedbed preparation cost for maize production is Ksh. 2400 per hectare. Planting and fertilizer cost of maize are Ksh. 2400 per hectare and 2600 per hectare respectively.
 - Pest control cost for stalk borer is Ksh. 300 per hectare, weeding cost is Ksh. 2600 per hectare,

Gunny bags for packing maize are purchased at Ksh. 40 each. Maize shelling is Ksh. 40 per bag. Maize yield is 60 bags per hectare. The maize price is Ksh. 1500 per bag (10mks)

SAMPLE PAPER 1

MARKING SCHEME

1.
 - i) Physical/ mechanical weathering
 - ii) Biological weathering
 - iii) Chemical weathering
2. Characteristics of a perfect market
 - i) Large number of sellers and buyers
 - ii) Homogeneity of product
 - iii) Freedom of entry and exit
 - iv) Perfect knowledge of the market
3.
 - i) Afforestation- Planting of trees where they have never existed before
 - ii) Reforestation- Planting of trees where they have been cut
4.
 - a) Tissue culture – Cultivation of plant cells tissue or organs on specially formulated nutrient media

 - b) Two benefits of tissue culture
 - i) Mass production of planting materials
 - ii) Disease free plants are obtained
 - iii) High yielding and early maturity crop clones are produced
 - iv) Plantlets developed maintained parental characteristics
5. Two ways a government can minimize risks and uncertainties
 - i) Weather forecasting

- ii) Research and extension services
 - iii) Subsidisation of input prices
 - iv) Market regulation
6. Disadvantages of shifting cultivation
- i) Only practised where land is unlimited
 - ii) Soil fertility is not preserved
 - iii) Cannot be practiced with perennial crops
 - iv) No permanent farm planning and improvements
7. a) Broadcasting is the scattering of the seeds all over the field/ farm in a random manner
- b) Advantages of row planting
- i) Machines can be used easily between the rows
 - ii) Easy to establish the correct plant population
 - iii) Lower seed rate is used
 - iv) Easy to carry out cultural practice
8. a) Multistorey – Growing of trees of different heights in a plantation of coffee or tea bushes
- b) Two benefits of multistory cropping
- i) Trees act as wind break for crops
 - ii) Creates suitable micro climate for the crops
 - iii) Source of timber and firewood
 - iv) Provision of fruits
9. a) Organization of people who join together voluntarily for economic benefits (O.W.T.E)
- b) Functions of a farmer co-operative
- i) Selling of farmers produce
 - ii) Providing farmers with input at subsidized prices
 - iii) Providing marketing services and information
 - iv) Processing of farmers produce
 - v) Providing education to its members
 - vi) Providing credit facilities to members

- vii) Paying out dividends to members
10. a) Four structures used to store water in a farm
- i) Dam
 - ii) Weir
 - iii) Plastic tank
 - iv) Concrete tank
 - v) Pond
 - vi) Well
- b) Two reasons why water treatment is important in a farm
- i) To kill disease- causing organisms
 - ii) To make water clean through removal of foreign solid particles
 - iii) Remove chemical impurities which are harmful to man
 - iv) Remove odour and bad taste from water
11. a) Mulching is the placement of materials such as banana leaves or polythene sheets on the ground next to growing crops (O.W.T.E)
- b) Two importance of mulching
- i) Prevent water loss/ reduce evaporation rate
 - ii) Smothers weeds
 - iii) Organic materials decompose to release nutrients and forms humus
 - iv) Regulate soil temperature
 - v) Reduce soil erosion
 - vi) Improve soil structure
 - vii) Improve water retention capacity of the soil
 - viii) Improve texture
 - ix) Improve microbial activity

SECTION B

12. a) Individual pegging method
- b) Procedure of carrying out the method
- i) Young tea plants grow for one year or to a height of 30cm
 - ii) Cut back tea plant to 15cm above the ground
 - iii) Branches allowed to grow to a height of 60-75cm

- iv) Force the branches to grow to an angle of 30° to 40° by use of pegs
- v) Nip off the tips of the branches to stimulate the dormant buds to grow into shoots
- vi) ***NB The points must follow the above order***
- c) Two precautions observed when plucking tea leaves
 - i) Plucked tea leaves should be placed in woven baskets, carried on the backs of the tea pluckers
 - ii) Do not compress tea leaves in the baskets since it leads to heat up and turn brown lowering the quality
 - iii) Keep plucked tea under a shade
 - iv) Plucked tea should be taken to the factory immediately
 - v) Discard dormant tea shoots
- 13. a) Two characteristics of Annual weeds
 - i) Rapid growth rate
 - ii) Produce a lot of seeds for dispersal
 - iii) Only propagate by seeds
 - iv) Spread and colonise a large area very quickly
- b) Effects of water hyacinth in Agriculture
 - i) Clogging of water masses which impedes navigation
 - ii) Distracts movement of fishing boats
 - iii) Interferes with aquatic life by reducing numbers of some aquatic animals
 - iv) Expensive to control
 - v) Affects recreation sports e.g. yachting and sailing
- c) Two limitations of legislative weed control method
 - i) Only sample specimen are checked while the bulk which might contain the weeds may escape official censorship
 - ii) Laxity in law enforcement may lead to prohibited plant material gaining access into the country
- 14. a) Advantages of having the part labeled J:

- i) To reduce the amount of water loss through evapotranspiration
- ii) To modify the temperature
- iii) To reduce the impact of raindrops thereby minimize the damage of seedlings/
reduce splash
- iv) Retaining water
- b) Management practices carried out on the nursery from the seeding emerge to stage
of transplanting
 - i) Proper watering
 - ii) Controlling weeds
 - iii) Controlling pests and diseases
 - iv) Hardening off
 - v) Pricking out

15. a) Marginal rate of substitution is how much of one resource factor can be replaced by one
unit of another factor maintaining the same level of production i.e.

$$\text{MRS} = \frac{\text{Change of input being replaced}}{\text{Change of input being added}} \quad (\text{O.W.T.E})$$

- b) $\text{MRS} = \frac{\text{Change of input being replaced}}{\text{Change of input being added}}$ ✓
 $= \frac{\text{Change in maize grain}}{\text{Change in wheat grain}}$ ✓
 $= \frac{60-50}{47-40} = \frac{10}{7} = 1.42$ ✓

SECTION C

16. a) **Marketing functions:**
- i) Buying and assembling
 - ii) Transporting and distribution
 - iii) Storage
 - iv) Packing
 - v) Processing
 - vi) Grading and standardization
 - vii) Packaging

- viii) Collecting market information
- ix) Selling
- x) Financing
- xi) Bearing risks
- xii) ***NB each point well explained 1 mark***

b) **Problems of marketing Agriculture products**

- i) Perishability
- ii) Seasonality
- iii) Bulkiness
- iv) Poor storage facilities
- v) Poor transport system
- vi) Changes in market demand
- vii) Limited elasticity of demand
- viii) Lack of market information
- ix) ***NB stating 1 mk Explanation 1 mk***

17. a) **Ecological Requirements:**

- i) rainfall – 760mm – 1300mm p.a, well distributed
- Low rainfall requires surface irrigation to be done
- ii) Altitude – 0-2100m a.s.l
- iii) Temperature - 18°C - 29°C
- iv) Soil- deep well drained fertile soils
- v) Soil ph = 6.0- 6.5

b) **Nursery establishment**

- i) Clear the vegetation
- ii) Dig deeply to achieve a fine tilth
- iii) Raise the soil slightly above the ground
- iv) Make drills and sow the seeds
- v) Cover the seeds with a thin layer of the soil
- vi) Erect a shade

c) **Transplanting**

- i) Done early in the morning or late in the evening

- ii) Dig holes 15cm deep
- iii) Spacing 90cm x 60cm or 100cm x 50cm
- iv) Put a handful of manure or a teaspoonful of D.S.P fertilizer per hole
- v) Mix them well with the soil
- vi) Place each seedling in the hole, cover and firm the soil around it
- vii) Mulch and shade it
- viii) Water

d) **Preparation of main seedbed**

- i) Done early during dry season
- ii) Plough deeply
- iii) Remove all weeds
- iv) Harrow the land to medium tilth

e) **Field management practices**

- i) Top dress with C.A.N two times at 25cm height (100kg/ ha) and during fruiting (200kg/ ha)
- ii) Field should be weed free
- iii) Irrigation recommended where rainfall is inadequate
- iv) Stacking
- v) Prunning
- vi) Mulching
- vii) Pest control
- viii) Disease control

18. a) **Uses of farm Records**

- i) Show the farmers assets and liabilities which help the farmer to know his net worth
- ii) Used to obtain loan or credit facilities
- iii) Help the farmer to compare his farm performance with other farms
- iv) Give the history of the farm
- v) Help in fair assessment of income tax
- vi) Help in settling disputes between heirs where there is no written will during succession

- vii) Help in sharing of profit in partnership
- viii) Help the farmer to plan a budget
- ix) Help the farmer to compare productivity of different enterprises in the farm
- x) Help in controlling losses and theft in the farm

b) PARTIAL BUDGET FOR KATO FARM ✓ ½

| ½ Debit (-) | Kshs | Ct | Credit (+) ½ | Ksh | Ct |
|----------------------------------|----------|----|---------------------------------|---------|----|
| <u>Extra costs</u> | | | <u>Cost saved</u> | | |
| - Replacement heifers 3500 x2 | 7000 ✓ ½ | 00 | Seedbed preparation ½ ✓ | 2400 | 00 |
| - Veterinary charge 600x2 | | | Planting ½ ✓ | 2400 | 00 |
| - Concentrates 1500x2 | 1200 ✓ ½ | 00 | Fertilizer ½ ✓ | 2600 | 00 |
| | 3000 ✓ ½ | 00 | Stalk borer dust ½ ✓ | 300 | 00 |
| | | | Weeding cost ½ ✓ | 2600 | 00 |
| | | | Harvesting cost ½ ✓ | 2600 | 00 |
| | | | Gunny bags (60x40) ½ ✓ | 2400 | 00 |
| <u>REVENUE FOREGONE</u> | 90000 | | Shelling (60x40) ½ ✓ | 2400 | 00 |
| Income of maize 1500x60 | ✓ ½ | 00 | <u>EXTRA REVENUE</u> | | |
| | | | Sale of milk 3500x2@ 25 ½ ✓ | 175,000 | 00 |
| | | | Sale of extra calves 5000x2 ½ ✓ | 10,000 | 00 |
| | | | Cull prize 2500x2 ½ ✓ | 5000 | 00 |
| | | 00 | | 207,700 | 00 |
| | 101,200 | | | | |

Total gains = Extra revenue+cost saved

Total cost = Extra costs + revenue forgone

Net gain/ loss = total gains – total cost

$$= 207,700-101,200 = 106,500 ✓ 1$$

∴ It is advisable to reduce the acreage under maize and replace it with dairy cows since a profit of 106,500/= is realised

SAMPLE PAPER 2

SECTION A (30MARKS)

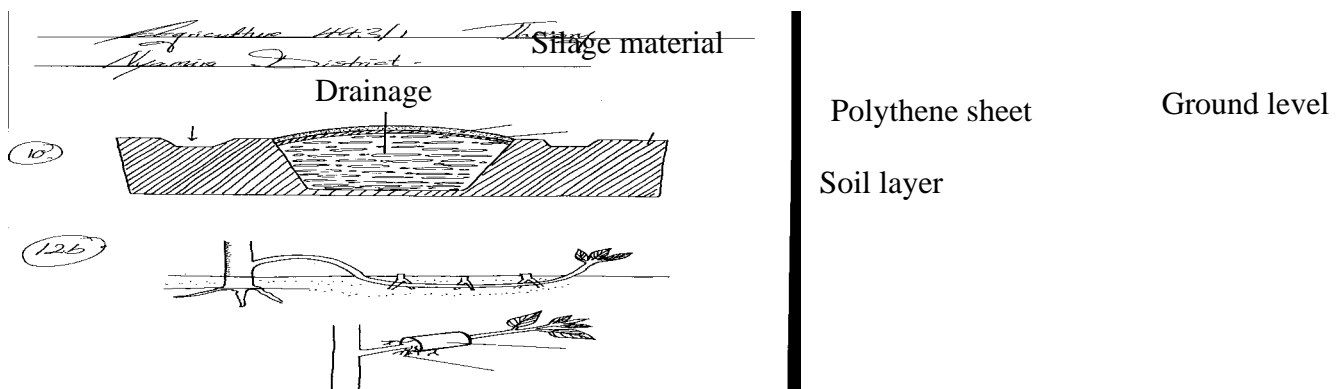
ANSWER ALL QUESTIONS

1. Define organic farming 1mk
2. State why agriculture is regarded as a science. 3mks
3. Give two effects of HIV/Aids on agricultural production and development. 2mks
4. a) State three farming practices that help in reducing the effects of water shortage in crop production 3mks
b) Distinguish between the two micro-catchments for water conservation.
Negarims 1mk
Semi-circular bunds 1mk
5. Give the disadvantages of organic manure used in agricultural farms. 2mks
6. Give two methods that can be used in carrying out topping in pasture field. 2mks
7. In what ways can wind positively influence arable farming. 2mks
8. a) Give the importance of rogueing as used in crop management. 1mk
b) State three ways used in banana stool management. 3mks
9. a) Apart from the identity of owner, title number and size of land, name other essentials contained on a land title deed. 3mks
b) Give the importance of a land title deed. 3mks
c) State the reasons for root pruning in agro forestry seedlings. 3mks

SECTION B (20 MARKS)

ANSWER ALL QUESTIONS

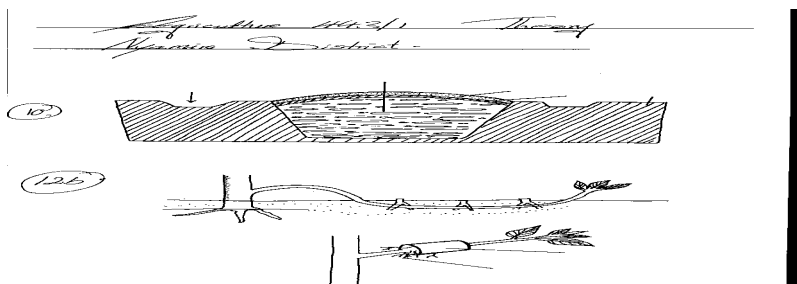
10. Study the diagram on silage making shown below and answer the questions that follow.



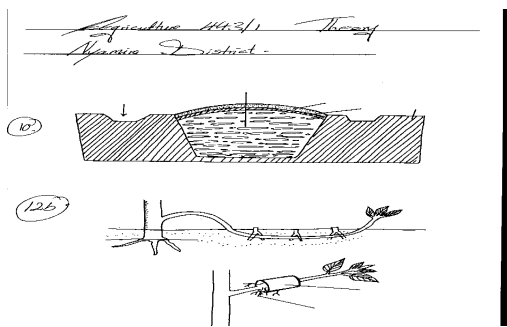
- a) Identify the silage preparation method shown above. 1mk

- b) Give the precautions taken when ensiling to ensure high quality silage. 2mks
- c) State two advantages of this method of forage conservation over other methods. 2mks
- 11. a) Give the ionic form in which nitrogen is absorbed by plants. 1mk
- b) State two roles of potassium in crop production 2mks
- c) Mention two properties of nitrogenous fertilizers. 2mks
- 12. a) Identify two methods of plucking table formation in tea establishment 2mks
- b) Identify the crop propagation methods illustrated below

(i)



(ii)



Rooting medium
Developing roots

- c) State two factors that would promote root formation in the propagation method in a (ii) above 2mks
- 13. a) State four reasons why land is prepared before planting 2mks
- b) Give one reason in each case why the following tertiary operations are important. 3mks

- (i) Ridging
- ii) Rolling

- iii) Levelling

SECTION C (40 MARKS)

ANSWER ANY TWO QUESTIONS

14. a) Describe field production of cabbages under the following subheadings:
- i) Nursery bed management practices (6mks)
 - ii) Transplanting (5mks)
 - iii) Harvesting (3mks)
- b) Explain factors that should be considered before embarking on the control of pests.
(6mks)

15. a) Describe the physical (structural) methods of soil and water conservation (10mks)
- b) Explain the negative impacts of soil erosion in agriculture (5mks)
 - c) State ways by which soil loses fertility. (5mks)

16. A farmer in Ekerenyo division wishes to change from arable farming to dairy goat production. In arable farming he has been spending kshs.400 on weeding maize and ksh 200 on weeding cabbages. He spends ksh.500 and ksh 300 on harvesting maize and cabbages respectively. He buys the following inputs; DAP fertilizer at Ksh.1000, cabbage seeds for ksh 400, maize seeds for ksh 600. Pesticides cost ksh800. He also spends ksh. 300 on shelling of maize.

The change in enterprise will have the following implications; He will buy 5 dairy goats at ksh.2,000 each; pay milk man ksh.3,000; control diseases at a cost of ksh.1500. Fencing of the farm will be done at a cost of ksh.1,500.

The revenue he gets when growing maize is ksh.10,000 and cabbages is ksh.4,000. In dairy goat production, he will get ksh 20,000 from sale of milk and ksh 1000 from sale of manure

- a) Prepare a partial budget and advise the farmer whether the change is worthwhile or not.
(12mks)
- b) Explain factors that determine the choice of a farming enterprise (system) (8mks)

SAMPLE PAPER 2

MARKING SCHEME.

SECTION A

1. Organic farming

It is a method of farming in which crop growing and livestock rearing is done without using agricultural chemicals.

2. Agriculture is a science because it entails:

- Scientific study of crop diseases (pathology)
- Scientific study of insects and their control
- Agricultural engineering (soil water conservation and machines)
- Scientific study of soils
- Genetics of plant and animal breeding

3. Effects of HIV/ AIDS on agricultural production

- The infected die hence shortage of farm labour
- Cost of living is raised-A lot of money spent on drugs at the expense of farm inputs
- Loss of hope, lack of motivation leads to low agricultural developments
- The infected lack strength to work adequately on the farm
- A lot of time is spent caring for the sick at the expense of farm work

- A lot of funds are directed to seminisise/ control the pandemic by the government instead of using the resources in agricultural department

4. a) Farming practices that help reduce effects of water shortage in crop production

- Mulching
- Early planting
- Planting early maturing crops
- Practicing land fallowing
- Contour cropping/ contour farming

b) Micro-catchments for water in the farm

Negarisms: are V shaped or closed grid-like earth ridges constructed on sloppy or gentle

slopes for planting trees or tree crops.

Semi circular bunds: are semi-circular earth bunds/ ridges constructed along the contours in a staggered pattern on range lands for tree planting.

5. Disadvantages of organic manure

- Are bulky
- Are carriers to crop pests and diseases
- Are labor demanding
- Easily lose nutrients if not properly stored
- Can lead to scorching of crops if not properly decomposed

6. Methods of carrying out topping

- Slashing/mowing
- Overgrazing

- Burning

- 7. Positive influence of wind on arable farming
 - Cools the environment where humidity is high
 - Blows rain bearing clouds to cause rainfall on arable land
 - It facilitates cross pollination
 - Facilitates dispersal of tiny seeds to increase crop population where there was poor germinantility

- 8. a) Importance of rogueing
 - Controls the spread of diseases
- Ensures healthy crop stand
 - b) Management of banana stool
 - Thin extra suckers to 3-6 plants/stool
 - Weed around the base of the stool
 - Control of pests and diseases using suitable chemicals
 - Trim off diseased leaves to control the spread
 - Prop/support the tall banana plants before the fruits mature
 - Apply manure (organic) or nitrophorous fertilizers 20:20:0

- 9. a) Information on title deed apart from identity, no and size of land
 - Location/plot number
 - Serial no
 - The seal
 - Signature of issuing officer
 - Date of issue
 - Type of ownership i.e. leasehold, absolute or free hold
 - Conditions of ownership if any

- b) Importance of land title deed
- It is a proof of ownership
 - Reduce land ownership disputes
 - Can be a security in acquisition of loan
 - It is an incentive for investment by the farmer on long term project
 - The owner can courageously lease out whole or part of his land for income
- c) Reasons for root pruning in agro forestry seedlings
- For seedlings to develop strong, short root system
 - For easier lifting of seedlings for out planting/ transplanting
 - To minimize seedling damage during transplanting / outplanting

SECTION B

- 10.a) Identity of the silage making method
- Trench silo
- b) Precautions during ensiling for high quality silage
- Fast filling of the material into the silo
 - compacting/pressing
 - The last layer covered with polythene sheet to prevent air and water
 - Drainage channel should be made to ensure run off water is kept away
- c) Advantages of silage making over the other methods
- Few field losses
 - More nutrients are preserved
 - Can be preserved for a long period of time
 - No storage problem
 - Does not depend much on weather conditions
 - Does not entirely require liquid additives

11.a) Ionic form in which nitrogen is absorbed

-NH₄⁺

NO₃⁻

b) Roles of potassium

- Important in carbohydrate formation and translocation
 - Necessary for the neutralization of organic acids in plants
 - Assists in uptake of nitrates from the soil hence influences a balance of nitrogen and phosphorous uptake by plants
 - It is a component of chlorophyll molecule
 - Strengthens plant stalks/ imparts resistance to lodging
- Influences opening and closing of stomata / regulate

c) Properties of nitrogenous fertilizers.

- Are highly soluble in water
 - Are easily leached
 - Have short residual effect
 - Have a scorching/ burning effect
 - Are highly volatile
 - Are hygroscopic
- Are highly corrosive

12.a) **Methods of plucking table formation in tea**

- Formative pruning
- Pegging

b) i) Trench layering
ii) Aerial/ marcotting layering

c) Factors that promote root formation

- Availability of moisture

- Treatment and application of auxins (hormones)
- Availability of oxygen
- Use of proper propagation technique to ensure better healing of wound/ keeping rooting medium in contact with the stem.

13.a) Importance of land preparation

- To enable water to infiltrate and assist in the conservation of moisture in the soil
- To kill weeds
- To improve soil aeration
- To incorporate organic matter into the soil and encourage decomposition
- It brings nutrients present in the subsoil to the surface
- To destroy pests and disease agents
- It loosens the soil for easy germination and root development

b) Reasons for ridging

- Soil conservation on sloppy land
- Planting of root crops
- Opening furrow e.g. for irrigation or planting crops like sugar cane

i) Rolling:

- Done to improve contact between the seed and soil
- Helps to compact the soil hence reduces soil erosion

ii) Leveling:

Helps to make seedbed uniform/ allows uniform depths at planting

SECTION C

14.a) Cabbage production

i) Nursery bed management practices

- Watering in the morning and evening

- Thinning
- Gapping/ reseeding
- Weeding
- Controlling pests diseases/ spraying with appropriate pesticide
- Removal of mulch after germination
- Pricking out
- Hardening off

ii) Transplanting

- To be done after 1 month after sowing
- Done early in the morning or evening/ cloudy cool rainy day
- Wetting the nursery before uprooting seedlings
- Seedlings uprooted with a ball of soil / Avoid damaging roots
- Seedlings to be planted in the seedbed at same depth as they were in the nursery/10cm
- Spacing of 60x90 cm
- Seedling to be kept upright and soil around it firmed by pressing
- Tea spoonful of DAP/ phosphatic fertilizer per hole and mixed thoroughly with soil
- Mulching
- Watering
- Only big seedlings should be transplanted
- Weak ones should be used for replacing those which dry up after transplanting

iii) Harvesting

Harvested 3-4 months after transplanting

- Heads are cut when they are solid and compact
- Are cut at the base
- Harvested cabbages may be bagged first or just thrown onto Lorries and pick ups
- Harvested cabbages should have 2-3 wrapper leaves but excess foliage should be removed

- Ensure you do not bruise any leaves especially around the head and even the wrapper leaves

b) Factors considered before embarking on the control of pests

- Biology of the pest
- Population of the pest
- Nature and consequence of damage caused
- Effect of weather and season on the pest
- Presence or absence of the pest predators or natural enemies

Factor-1mk

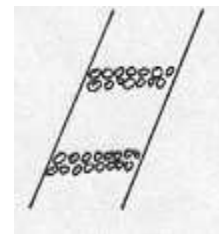
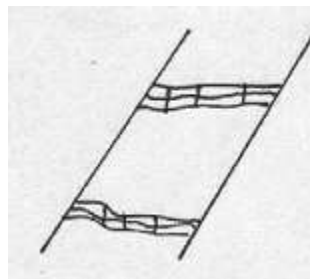
15.a) Physical or structural control measures

Are measures that involve mechanical construction and include:

i) Trash lines/ Stone line

- Trash which is made up of residues or stones are heaped along the contours
- Helps to trap soil when being washed away besides reducing the velocity of runoff
- Trash are held in position by pegs/ poles

Trash line

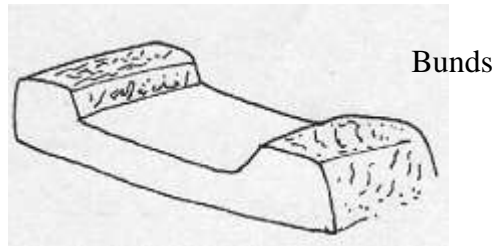


Stone line

Bunds

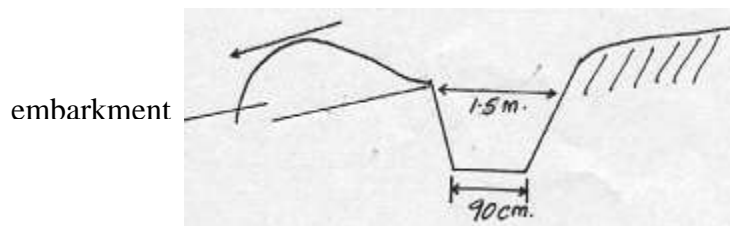
- Are heaps of soils along the contour
- Grass may be planted on top of bunds to hold them together
- The banks of earth are 1-2m wide at the base of 60 cm high
- They are built on contour with short-ties 5-10 m to channel above the bund

- Bunds are suitable for fairly small cultivated areas on moderate slopes, where they should not be more than 30 m apart



ii) Cut-off drains

- Open trench with embankment on lower side
- Diverts excess water from farm land to less erodable area
- Reduce speed of run-off and trap soil



iii) Terraces

- Are constructed to reduce the surface flow and carry away excess water which cannot be absorbed by soil.
- Types include: broad cast, narrow based, bench and fanya juu terrace

iv) Gabions/ Porous dams

- Gabions are boxes of galvanized wire mesh filled with stones which are built across slopes and gullies

- The boxes are heavy enough to resist movement even by large water flows
- Gabions trap soil and also reduce the erosive force of run-off by reducing the speed

v) Dams and weirs

- Are barriers constructed across a river or another water way to hold and restore water
- Also reduces the speed of water

b) Negative impact of soil erosion on agriculture

- Removal of soil nutrients and beneficial organisms hence lowers productivity of land
- Sedimentation and siltation of dams, lakes, rivers, and ponds leads to decline of fish
- Uprooting plants and exposing plant roots
- Burying of crops
- Destruction of soil structures

c) Ways through which soil loses fertility

- Leaching of soluble nutrients
- Soil erosion
- Burning of vegetation and plant residues
- By continuous plant uptake
- Change of soil PH
- Accumulation of salts

PARTIAL BUDGET

16.a)

| DEBIT (-) ✓ 1 | | CREDIT (+) ✓ 1 | |
|-----------------------------|---------------------|------------------------|---------------------|
| Extra costs incurred | | Extra revenue | |
| Cost of 5 dairy goats | 10000 00 | Milk sales | 20000 00 |
| Salary of milk man | 3000 | Manure sales | 1000 00 |
| Disease control | 500 | | |
| Fencing | 1500 | Costs saved ✓ 1 | 21,000 00 |
| | 15000 ✓ 00 | Weeding maize | |
| Revenue forgone | | Weeding cabbages | |
| maize | 10000 00 | Harvesting maize | 400 00 |
| Cabbages | 4000` 00 | Harvesting | 200 00 |
| | 14000 ✓ 00 | cabbages | 500 00 |
| | | DAP fertilizers | 300 00 |
| | | Maize seeds | 1000 00 |
| | | Cabbage seeds | 600 00 |
| | | Pesticides | 400 00 |
| | | Shelling maize | 800 00 |
| | | | 300 00 |
| | | | ✓ 4500 00 |
| | 29000 ✓ 1 00 | | 25500 ✓ 1 00 |

$$\begin{aligned}
 & (\text{Extra revenue} + \text{cost saved}) - (\text{Extra costs incurred} + \text{revenue forgone}) \checkmark 1 \\
 & = 25,500 - 29,000 \\
 & = -3,500 \checkmark 1
 \end{aligned}$$

This indicates a loss hence the change is not worth while. He should not change the enterprise ✓ 1

b) Factors that determine the choice of a farming enterprise (system)

- Taste and preference of the consumer
- Availability of capital/resources
- Cultural/ traditional/ religious beliefs
- Knowledge of the farmer about the enterprise
- Government policy
- The enterprise itself
- Climatic factors
- Farmers choice

SAMPLE PAPER 3

SECTION A (30 Marks)

Answer all the questions in this section in the spaces provided

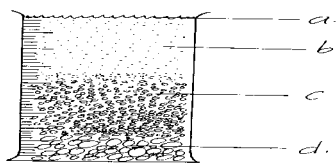
- 1 (a). Name two systems of farming practiced in Kenya {1mk}
b). State two roles of Agriculture in the economy of Kenya {2mks}
c) Name two areas of scientific study which show that Agriculture is a science {1mk}
2. State three, disadvantages of mixed farming. {3mks}
- 3 (a) Weeds lower the quality of farm produce. Give two examples to support this.2mks}
(b). State two reasons why chemical weed control is uncommon in small scale farms.
{ 2 mks}
- 4 (a) State two qualities of soil that rice requires . {2mks}
b). State two reasons why rice should be spaced very closely. {2mks}
- 5 (a) Define inventory records. {1mk}
b). State four pieces of information that is contained in health records. {2mks}
- 6 (a) State the meaning of the following terms used in agricultural economics. {2mks}
(i) Opportunity cost.
(ii) Scarcity
(b) Name four factors of production in agriculture. {2mks}
- 7 (a) State four ways by which organic matter helps to improve sandy soil for crop production.
{4mks}
(b) State any two symptoms that can be observed in cereal crops that are deficient in nitrogen.
{2mks}

c). State two functions of terraces in soil and water conservation. {2mks}

SECTION B (20 MARKS)

Answer all the questions in this section in the spaces provided.

8. The diagram below shows a kale seedling attacked by a pest.

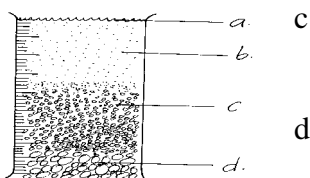
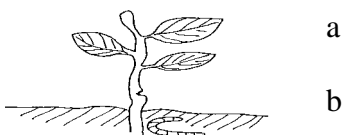


(i). Identify the pest. (½ mk)

(ii). What damage does the pest cause to the crop. (½ mk)

(iii). State two methods of controlling the pest. (2mks)

9 (a) Form two student put some soil sample in a measuring cylinder, added some water and sodium carbonate and then covered the cylinder with the hand and shook the cylinder for about two minutes. He left the cylinder on the bench for one hour. The result was as shown below.

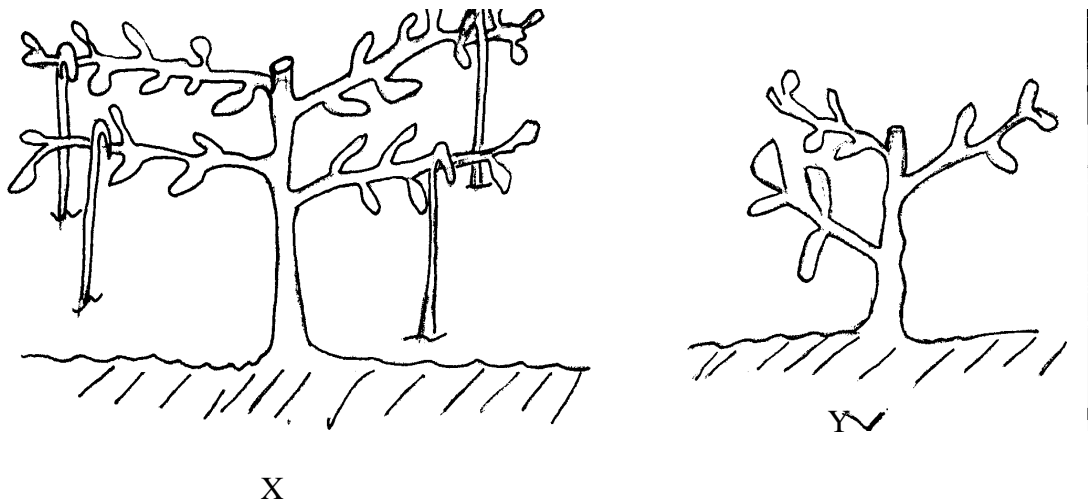


(i). Name the layers marked a,b,c, and d. (2mks)

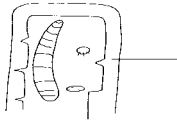
(ii). What was the function of sodium carbonate in this experiment? {1mk}

(iii). What was the aim of this experiment ? {1mk}

- 10 (a) A farmer was advised to apply compound fertilizer 20 - 20 - 10 on an orchard measuring 20m x 10m at the rate of 80Kg/ha. Calculate the amount of fertilizer the farmer would require for the orchard. {2 mks}
- (b) A small scale farmer has 2 hectares of land of beans . He was interested to know the amount of fertilizer needed for his shamba. He was advised to apply 40Kg N per ha. and 60Kg P₂O₅ per ha. in order to get high crop yields. The fertilizers available in the shop are SSP (20% P₂O₅) and S/A20% N) calculate the amount of each fertilizer the farmer will buy for his shamba. {4mks}
- 11 (a) Given below are illustrations of two methods of frame formation in tea labeled x and Y.



- (i). Identify the two methods of frame formation above
- (ii). Why is it necessary to prune young tea plants as illustrated above? {1mk}
- (iii). Explain briefly how plucking table is formed . (2mks)
- b). Study the diagram shown below and answer the questions that follow.



Stem part

- (i). Identify the pest. { ½ mk}
- (ii). State one method that can be used to control the. above pest. { 1mk}
- (ii). Give one example of a plant attacked by the above pest. {½mk}

SECTION C. 40MKS

- 12. Describe field production of tomatoes under the following headings.
 - (a). Ecological requirements {3mks}
 - (b) Land preparation {3mks}
 - (c) Transplanting { 4mks}
 - (d) Weed control { 3rnks}
 - (e) Harvesting {5mks}
 - (f) Disease control {4rnks}

- 13 (a) What is a balance sheet? { 1mk}

Prepare a balance sheet for Mr. Tum who is a farmer and wishes to borrow a loan from the bank to develop his farm. {14 mks}

Mr. Tum obtained a bank overdraft, of Kshs. 15,000/= Previously he had a loan of Kshs. 50,000/= which enabled him to construct a modern milking shed and also did some permanent improvement in the farm. The inventory of the farm as at 3 1 / 1 2/05 is as shown

| | |
|-------------------------|-----------------|
| Value of land | Kshs. 40,000/ = |
| Machinery and Equipment | Kshs. 35,000/ = |
| Buildings | Kshs. 45,000/ = |
| Cattle | Kshs 20,000/ = |
| Sheep | Kshs. 5,000/ = |
| Coffee | Kshs. 45,000/ = |

- provide market for industrial goods
- Source of capital
- Source of raw materials for industries.

c). - Pathology

- Entomology
- Parasitology
- Genetics
- Soil science
- Ecology
- Agricultural Engineering
- Agronomy

2. Labour for the both crops and livestock is difficult to manage

- Technical advise for both crops and livestock is difficult to obtain
- The farmers interest is divided.

It is expensive to run the two enterprises.

3(a) - Mexican marigold gives undesirable flavour to milk .

- Devils horsewhip/Forget me not/black -lower quality of wool.
- Wild oats lower quality of wheat grains.

(b). - Buying chemicals is very expensive.

- The mixing and application requires technical skills.
- The application's are expensive to buy and maintain

- Lands are small and manual labour is more appropriate and cheap

4(a). - Should allow irrigation water to be retained for long time (high water holding capacity.

- Should have high water table that will prevent water from draining fast (poorly drained).

(b). - To control the growth of weeds

- To avoid continuous tillering which results in different stages of ripening which make harvesting difficult.

5(a) Inventory is a record which show all the assets and liabilities of a business.

(b). - Date

- Disease symptom'
- Animal (s) affected
- Drugs used
- Cost of treatment given
- Remarks

6(a). Opportunity cost - refers to the value of the foregone alternative or the returns from the next best alternative forgone.

Scarcity - Derived from the word scarce which means limited, less than required i.e resources needed for agricultural production are not enough.

b). - Land

- Labour
- Capital
- Management (Entrepreneurship)

7(a) - Supply plant nutrients.

- Improves soil structure
- Reduces soil erosion
- Provide nourishment for some useful soil micro-organisms.
- Improve moisture holding capacity-

b). Leaves become chlorotic yellow or yellowish green.

- Stunted growth
- Leaves may turn brown and drop out prematurely
- the plant may develop other colours but not green.

(c). Reduces the speed of running water and hence erosive force of water. Facilitates water infiltration into the soil

SECTION B.

8. (i). Cutworm

(ii). Cuts the stem above ground level, making the plant to lodge or fall.

(iii). - Dust around the plant with recommended pesticides.

Spray on the plant around the roots at ground level.

Early planting of the crop

Apply chemical poison in the hole together with fertilizer during transplanting.

9(i). a- floating organic matter (humus)

b- Water with fine clay particles and dissolved mineral salts.

c- Sand

D- Gravel

(ii). It aids in the dispersion of the soil particles.

(iii). To show that soil is made up of different sized particles

10. a).

20m

10m

Area - $10 \times 20 = 200 \text{ m}^2 = 1\text{mk}$

100,000m² require 80Kgs of 20 - 20 - 10

200m² will require 200 x 80

10000

= 1.6 Kgs

b). S/A contains 20Kgs N per 100 Kg.

100Kgs of S/A contains 20Kg n.

: 40Kg N will be provided by 100 x 40

20

1 ha. Of land requires = 200Kgf of S/A

2 ha will require 200 x 2 = 400Kg S/A

SSP - Rate recommended 60Kg P₂O₅ per ha

SSp has 20Kg P₂O₅i.e

100 Kg SSP contains 20Kg of P₂O₅

300 Kg SSP

60 Kg P₂O₅ will be provided by $100 \times \frac{60}{20}$

1 ha needs 300 Kg SSp

2 Ha will require $300 \times 2 = 600$ Kg of SSp

11. x - pegging method

y - formative pruning

(ii). To encourage young tea plants to develop several lateral branches which will establish a frame for the plucking table.

(iii) The plucking table is formed by allowing the new shoots to grow for about three months after which the growth is checked to a desired height by tipping in i.e removal of three leaves and a bud from each shoot at the required height of the plucking table i.e 60 cm above ground level.

b) (i). Maize stalk borer

(ii). - Burning infected maize crops remains after harvesting Early planting

(iii) - Maize

- Sorghum

SECTION C:

Application of dust/spray pesticides down the funnel of each plant

- crop rotation

12. Production of tomatoes

a). Ecological requirements

- (i) Temperature: - Require moderate temperatures and a warm season
- (ii) Altitude - between 0 - 2100 m above sea level
- (iii) Rainfall- Require a rainfall of 760 1300mm p.a
- (iv) Soils_ Do well in a wide range of soils so long as it is fertile and well drained - PH of 5.5 - 7.00

b). Land preparation:

- (i). Should be prepared during the dry season to allow time for settling.
- (ii) Land clearing is done by use of slashers or pangas
- (iii). Ploughing should be well done either by use of hand tools or tractor drawn implements.
- (iv). Harrowing, should be done by use of tractor drawn harrows or hand tools

(c). Transplanting:

- (i). Water the nursery bed before lifting the seedlings
- (ii) Select healthy vigorous seedlings
- (iii) Space seedlings at 90cm x 60 cm
- (iv). Transport without damaging the root and should be done on a cool day or late in the evening
- (v). Shelter plants from too much wind and heat
- (vi) Apply 200 Kg of double super -phosphate per ha. Or one tea spoonful of same per planting hole
 - (v) Mix the fertilizer thoroughly with the soil
 - (vi) Water seedlings after transplanting if weather is dry.

d). Weed control

- (i) Keep the field free from weeds at all times
- (ii) Weed mechanically by use of hands hoes / Jembes
- (iii) Avoid damaging the roots or burying leaves

| <u>LIABILITIES</u> | | | <u>ASSETS</u> | | |
|-----------------------|-------------------------|-----------------|--------------------|---------------------|------------------|
| Current liabilities | | | Current Assets | | |
| | Shs | Cts | | Shs | Cts |
| Bank overdraft | <u>15000</u> | <u>00</u> | Cash at bank | 8000 | 00 |
| Total C.L | <u>15000</u> | <u>00</u> | Debts receivable | 2000 | 00 |
| Long term liabilities | | | Livestock-cattle | 20000 | 00 |
| Loans -Bank | | | Sheep | <u>5000</u> | <u>00</u> |
| | <u>50000.00</u> | | Total C. A- | <u>35000</u> | <u>00</u> |
| Total T.L , | | <u>50000.00</u> | Fixed assets | | |
| Long term liabilities | | | Machinery and | | |
| Total liabilities | | | Equipment | | |
| | <u>65000.00</u> | | | 35000.00 | |
| Net worth | | | Building | | |
| | <u>135000.00</u> | | | 45000.00 | |
| Total | | | Land | | |
| | <u>200,00.00</u> | | | 40000. 00 | |
| | | | Perenial crops | | |
| | | | Total fixed assets | | |
| | | | | 165000. 00 | |
| | | | Total assets | | |
| | | | | <u>200,000. 00</u> | |

Award of marks - Correct entries ½ mk each

Title

Correct totals

Sub title ½ mk each

Correct placement of net worth

Total

c) Mr.Tum would qualify for a loan in the bank

Reason: The network is more than the loan applied for

d). Cost of production is obtained by multiplying the price of each unit of input by the price of each unit of input i.e Qx1 XP x1

Production cost = $Q \times P$

e) Uses of production costs

- It relates to the production of a given quality of a product in a given period of time

When costs are analysed and converted into monetary value they help to indicate the most profitable point of production

They are used to calculate profits.

SAMPLE PAPER 4

SECTION A (30 MARKS)

Answer All Questions in this section

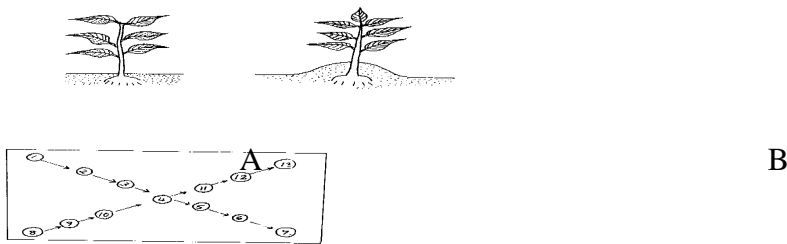
1. Mention Two ways in which losses may be incurred during hay making. 2mks
2. Give Two precautions taken to ensure good crop establishment during planting. 2mks
3. Give Two reasons why Agriculture is important for the development of industries. 2mks
4. Give Two economic importance of crop disease to a farmer. 2mks
5. State Two reasons for cultivation during dry period. 2mks
6. a) Define elasticity of demand. 1mk
b) Mention any Two factors influencing demand of cabbages. 2mks
c) Give Two problems a farmer is likely to face when marketing cabbages 2mks
7. Name two ways in which organic farming is carried out. 2mks
8. a) What is Agro forestry. 1mk
b) State Two ways in which Agro forestry is important. 2mks
c) Name Two common forms of Agro forestry 2mks
9. State two surface irrigation methods 1mk
10. State Two symptoms of sulphur deficiency in plants. 1mk

- 11. State Two advantages of tissue culture in crop propagation. 2mks
- 12. Name the classes of weeds according to plant morphology. 2mks
- 13. Give Two reasons for processing agricultural produce. 2mks

SECTION B (20 MARKS)

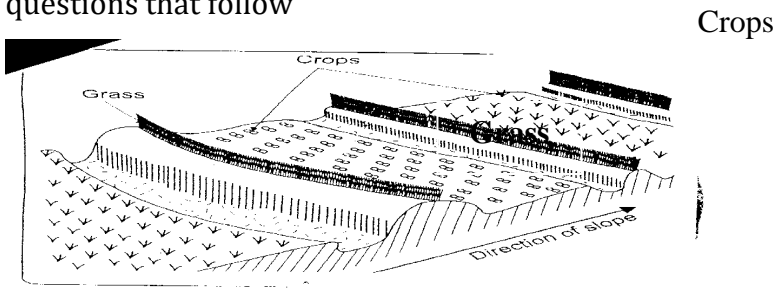
Answer all Question in this section

14. The diagrams below show a practice carried out on various crops on the farm. Study them carefully and answer the questions that follow.



- a) Identify the farm practice represented by B. 1mk
- b) State the importance of the above practice in the following crops. 4mks
 - i) Maize
 - ii) Irish Potatoes
 - iii) Tobacco
 - iv) Groundnuts
- c) At what stage of growth should the above practice be carried out in maize. 1mk

15. Study a section of the diagram of soil conservation practice shown below then answer the questions that follow



- a) Identify the method of soil conservation illustrated on the diagram above. 1mk
- b) Explain Two ways in which the above method helps to conserve the soil and water. 2mks

16. The information below is on the financial and Asset valuation of school Farm at the end of the year 2002

| | |
|----------------------------------|-----------|
| Debts Payable | 80,000/= |
| Dairy cattle | 55,000/= |
| Maize in store | 19,000/= |
| Buildings | 125,000/= |
| Beans in store | 4,000/= |
| Calves | 5,000/= |
| Mature sheep | 7,000/= |
| 50 ha of land | 260,000/= |
| Machinery | 180,000/= |
| Cattle feed in store | 4,000/= |
| Office Equipment | 1,400/= |
| Tools in store | 10,000/= |
| Bank Deposit | 50,000/= |
| Debts receivable | 11,000/= |
| KFA Loan | 210,000/= |
| Bank Loan | 100,000/= |
| Wages | 41,200/= |
| Electricity/Telephone/Rent Bills | 100,500/= |

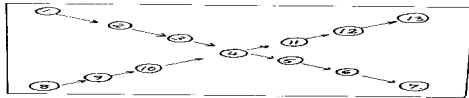
a) Draw up a balance sheet for the farm as at 31st Dec. 2002 using the above information.

5mks

b) Determine the solvency of the farm, giving reasons.

1mk

17. Below is a diagram on a method of soil sampling. Study it and answer the questions that follow.



- a) Identify the method shown. 1mk
- b) State four steps to be followed when sampling soil. 4mks

SECTION C (40 MARKS)

Answer any TWO questions from this section.

- 18. Describe the production of tomatoes/Dry beans under the following sub-headings.
 - a) Ecological requirements 4mks
 - b) Planting / Transplanting 4mks
 - c) Pest control 4mks
 - d) Disease control 4mks
 - e) Harvesting & marketing 4mks
- 19. a) (i) Define the term land tenure 2mks
(ii) Give three benefits of a Title deed to a farmer. 3mks
iii) State five effects of land fragmentation in crop farming. 5mks
- b) Briefly discuss the roles of any five marketing agencies and organizations. 10mks
- 20. a) Mention the various sources of water used in the farm. 6mks
b) Describe the process of water treatment for human consumption. 14mks

SAMPLE PAPER 4

MARKING SCHEME

443/1

1.
 - When slow drying of hay is practiced
 - When there's prolonged exposure of hay to sunlight /bleaching
 - Respiration/oxidation
 - When hay is rained on/rotting
 - Breakages and loss of leaves
2.
 - Use of certified seeds

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- Proper depth of planting
 - Recommended tilth
 - Timely planting
- 3.
- Source of raw material for industries
 - Source of market for industrial products
 - Capital gained from selling agricultural products can be used to expand industries
- 4.
- Increases cost of production when controlling them
 - Lowers quantity/quality of produce hence poor market price
- 5.
- faster
 - Vegetation gets time to dry and decompose
 - allows enough time for other operations
- 6.
- a) The degree of responsiveness of demand to change in price
- The amount of change in the quantity of products that consumer will buy in response to a given change in price
- b) - Population
- preference and tastes
 - price expectations
 - Perishability
 - Beliefs, customs & taboos
 - price of related goods
- c) - Transport problems
- Competition
 - perishability of the commodity
 - Seasonality
- 7.
- Use of organic manures
 - use of medicinal plants (as pesticides)
 - Crop rotation
- 8
- a) The growing of trees and crops and keeping of animals/ pasture on the same piece of land

- b.
 - Source of wood fuel
 - Source of income
 - soil conservation/reduce soil erosion/ soil & water conservation
 - Trees serve as wind breaks
 - Labour saving
 - Aesthetic value/ beautify the environment
 - Livestock feed
 - Food (fruits) for humans/farmer
- c) - Intensive hedgerow/intercropping
 - wide row planting
 - Border planting
- 9.
 - Basin
 - flood
- 10
 - Stunted growth
 - leaf Chlorosis
 - Thin Stems
 - Reduced nodulation
- 11.
 - Disease free planting materials can be obtained /used in disease control
 - used in mass production of propagules
 - its fast
 - it requires less space than cultural methods
- 12.
 - Broad leaved weeds
 - Narrow leaved weeds
- 13.
 - To improve flavor
 - To improve keeping quality/ shelf life
 - To reduce bulkiness
- 14.
 - a) Earthing up
 - b)
 - (i) Maize - provides support to prevent lodging
 - (ii) Irish potatoes - Improves tuber formation
 - (iii) Tobacco – Improves drainage around the plant
 - (iv) Ground nuts – promotes seed formation

c. During second weeding

- 15. a) Fanya Juu terrace
- b - has a channel to drain water

- has grass planted on the ridge to reduce the speed of running water and also protect the ridge/ retain eroded soil

- has ridges to reduce the speed of running water and hold back soil

- 16. a)

Balance sheet

School farm

As at 31st Dec 2002

| LIABILITIES | | ASSETS | |
|------------------------------|---------|-----------------------|---------|
| CURRENT LIABILITIES | | CURRENT ASSETS | |
| Wages | 41,200 | Bank deposit | 50,000 |
| Elect, Tel, Rent | 100,500 | Debts receivable | 11,000 |
| Debts payable | 80,000 | Maize in store | 19,000 |
| | | Beans in store | 4,000 |
| LONG TERM LIABILITIES | | Cattle feed in store | 4,000 |
| KFA loan | 210,000 | | |
| Bank Loan | 100,000 | FIXED ASSETS | |
| | | Tools in store | 10,000 |
| | | Office equipment | 1,400 |
| | | Mature sheep | 7,000 |
| | | Calves | 5,000 |
| | | Dairy cattle | 5,500 |
| | | Machinery | 180,000 |
| Total Liabilities | 531,700 | Building | 125,000 |
| Owners equity | 150,200 | 50 ha of land | 260,000 |
| | 681,900 | | 681,900 |

b. The farm is solvent. Assets can be sold to pay for the liabilities and have a balance

BEANS

a) Ecological requirements

(i) Rainfall – average 625 per annum; heavy rains destructive during flowering stage

(ii) Altitude – 1000 – 2100 m above the sea level

(iii) soils – well drained fertile soils

b) Planting

- Planting at the onset of rains
- spacing 30 x 15 cm
- Apply phosphatic fertilizer during planting
- Plant at correct depth 5cm – 10cm deep

c) - Pest include bean aphid, bean bruchid, spotted borer, American bollworm, bean fly and golden –

ring moth

- Control – Spraying with various insecticides such as dieldrin, dimethoate, formathion or diazinon

d. Disease control

- Bacterial blight - (halo Blight) - Planting healthy seeds, uprooting and destroying infected crops

- rogueing and crop rotation

- Spraying with copper oxychloride from emergence

- Anthracnose - use of clean seeds and seed dressing with captan

- destroy infected crops residues

Spray weekly using benomyl, copper fungicide or mancozeb

e) Harvesting

- uprooting dry seeds in the morning
- gather uprooted plants on tarpaulins/ mats / sacks to allow for further drying
- beat dry plant with sticks to remove the seeds from the pods
- treat with appropriate pesticides and pack in bags
- marketing done through the agents of national cereals and produce board

17. a) Traverse method
- Clear the vegetation
 - Scoop the soil using a soil auger/appropriate tool
 - Mix the scooped samples in a container to obtain a sub – sample
 - place a sub sample in a polybag and send to the laboratory for testing

18 TOMATOES

a) Ecological requirement

- i) Rainfall – between 760mm – 1300mm (best)
- tolerate up to 2300mm
 - Rain should be well distributed over the growing period
 - Very heavy rainfall increases disease incidence /prolong maturity period
- (ii) Altitude - from 0 – 2100 m above the sea level
- (iii) Soil – deep, fertile and well drained

b) Planting /Transplanting

- Seedling lifted with a lump of soil around the roots
- only healthy and vigorously growing seedlings are lifted
- A garden trowel should be used to lift
- One seedling planted / hole and soil around it firmed
- Transplanting done preferably late in the evening on a cloudy day
- The seedling should then be mulched and watered regularly

- c) (i) American Bollworm – spraying with insecticides
- (ii) Cutworm, red spider mite and nematodes – use of appropriate pesticides and crop rotation

- d) (i) Tomato Blight - Preventive spraying using fungicides

- (ii) Bacterial wilt – Uproot and burn affected plant
- Use of certified seeds and crops control

- (iii) Blossom – end rot- Regular watering

- topdressing the crop with the right amount of nitrogen
- Application of calcium compounds in the soil

e. Harvesting/ marketing

- pick when ripen for tomatoes for canning
- pick when a reddish color starts to appear for fresh market tomatoes
- Large wooden crates used to transport tomatoes
- The fruit should be level with top's of crates to allow for piling of crates

19 a) (i) Is the rule and conditions governing the ownership of land in specific area or method by

which an individual /group of people acquire the right to use land in any place

Is the possession of right to the use of land

- (ii) - Used to secure credit facilities necessary for land development
 - Any disputes are minimised because of security of tenure
 - Tenure security encourages farmers to invest in long-term and permanent projects on their land and also care for the soil.
 - enables the occupant to lease all the land or part of it and thus get extra income
 - (iii) - Time wasted while traveling from one holding to the next
 - Difficult to properly and effectively control weeds and pests
 - Difficulty in following a sound farm plan arising from the distance between fragments and the farmer's home
 - Difficult in the supervision of scattered plots
 - Difficulty in carrying out various soil conservation measures
 - Difficulty in offering agriculture extension advice
 - poor agricultural productivity hence on standard of living
- b) Roles of marketing agencies and organizations
- (i) wholesalers – buy goods from the producers, processor / manufacturers in bulk and sell to retailers and other merchants in small quantities
 - (ii) Retailers – buy goods in bulk from the wholesalers or processors and sell to consumers in small quantities
 - (iii) itinerant Traders
 - Are middlemen who move from place to place buying agriculture commodities of various

Types from farmers e.g. fruits vegetables, goats e.t.c

(iv) packers and processors

- Change the form of the produce they handle to one more convenient for marketing and more

acceptable to the consumer

(v) Commission Agents

- Are middlemen who act on behalf of other businessmen for a fee/commission

(vi) Broker agents

(vii) Co-operative societies & union

(viii) Marketing boards

(ix) Auctioneers

20. a) Sources of water

(i) surface sources

- Rivers , streams and dams
- lakes

(ii) Underground sources

- Springs
- Wells
- Boreholes

(iii) - Rain water

b) Stages in treatment of water for human consumption

Stage 1 - Filtration at water intake

- Water passes through a series of sieves from the sources e.g. river before entering the intake pipe

Stage 2. Softening of water

Is the mixing chamber (a small tank) where water circulates and is mixed with soda ash and alum

Stage 3 - Coagulation and sedimentation

Is where solid particles such as silt and sand settle down. The tank is also open to allow bad smell to escape

Water stays here for 36 hrs to kill Bilharzia worms

Stage 4: Filtration

Is a tank where all the remaining solid particles such as silt are removed

Stage 5 Chlorination

- Chlorination tank is where a small amount of chlorine solution is added to kill the micro organism

Stage 6. storage

Is the final stage where treated water is stored in a large tank before distribution

SAMPLE PAPER 5

443/1

SECTION A (30 Marks)

Answer all the questions in this section in the spaces provided

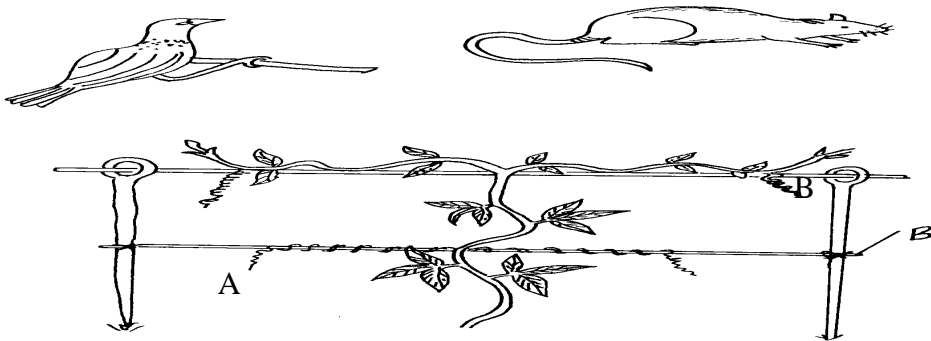
1. Name **four** main branches of Agriculture. 2mks
2. State **four** farming practices that maintain soil fertility. 2mkS
3. What is pollarding in crop production. 1mk
4. State four problems farmers encounter when sourcing for Agricultural credit. 2mks
5. Give one reason why phosphatic fertilizers benefit subsequent crop in Second and third year after application. 1mk
6. State two reasons why cassava should be grown as last crop in crop rotation programme. 2mks
7. State four importance of farm records. 2mks
8. Name two aspects of light that affect crop production. 1mk
9. (a) What is tissue culture? 1mk
(b) State two importance of tissue culture in crop propagation. 2mks
10. Give one effect of low temperature on the quality of tea. 1mks
11. Give two examples of joint products in livestock production. 1mk
12. Give four factors that influence time of planting crops. 2mks

13. State four factors that affect the effectiveness and selectivity of herbicides. 2mks
14. State two disadvantages of tenancy system of land tenure. 1mk
15. Distinguish the following terms as used in pasture management. 2mks
Intensity of defoliation
Frequency of defoliation
16. Give one reason why saw dust should not be used as mulching material in the field. 1mk
17. Differentiate between financial statement and financial document. 2mks
18. Give four effects of HIV/AIDS to agricultural production. 2mks

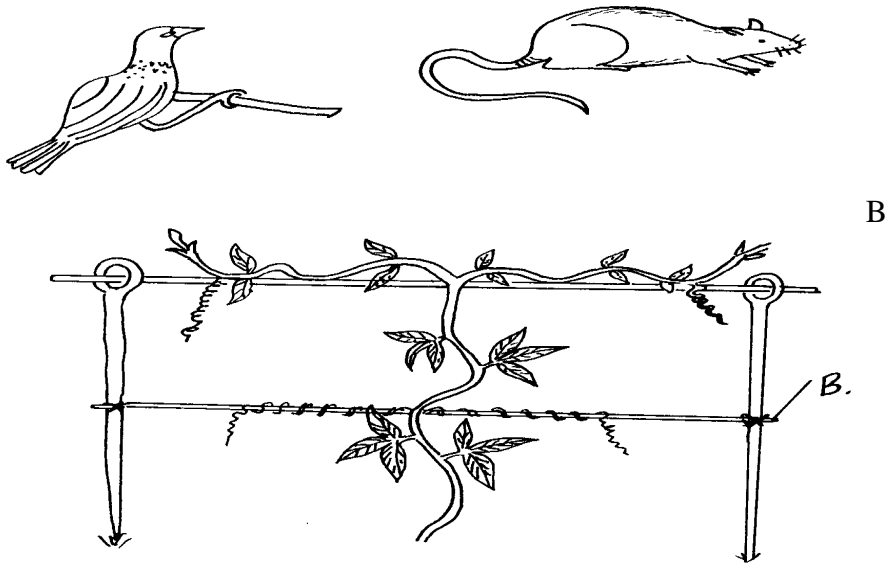
SECTION B (20 MARKS)

Answer ALL the questions in the space provided.

19.



- a) Identify the field pest shown by the illustration "A" and "B". 1mk
- b) State two effects of a pest expressed in illustration "A" above has on maize plant 2mks
- c) State two physical methods of controlling the pest in illustration "B" above. 2mks
20. Study the diagram below and answer the questions that follow.



- (a) Name the crop production practice illustrated above. 1mk
 - b) Name two materials that may be used as part B in the diagram 2mks
 - c) State two reasons why the practice is done in crops. 2mks
21. (a) What is water conveyance?. 1mks
- (b) Name two types of pipes used in the farm. 2mks
- (c) State two uses of water on the farm. 2mks
22. (a) What is agro-forestry? 1mks
- (b) State two benefits of agro-forestry. 2mks
- (c) Give two characteristics of trees used for agro-forestry. 2mks

SECTION C (40 MARKS)

Answer ANY TWO Questions in this section in the spaces provided in this booklet

23. Study the tables on demand and supply schedules of tomatoes in a town market.

| Tomato supplied (in kg) | Price per kg (sh). |
|-------------------------|--------------------|
| 200 | 7.00 |
| 180 | 5.20 |
| 175 | 4.80 |
| 162 | 4.00 |
| 156 | 3.70 |
| 135 | 2.80 |
| 100 | 1.60 |
| 92 | 1.40 |
| 80 | 1.20 |
| 75 | 1.10 |

| Tomatoes bought (In kg) | Price per kg (sh). |
|-------------------------|--------------------|
| 75 | 8.00 |
| 82 | 6.70 |
| 96 | 5.50 |
| 114 | 4.10 |
| 130 | 3.20 |
| 150 | 2.40 |
| 166 | 1.80 |
| 180 | 1.30 |
| 186 | 1.10 |
| 200 | 0.80 |

- a) On the same axis, draw the graphs of supply and demand of tomatoes in the market.
8mks
- b) What is the equilibrium price? 1mk
- c) What would be the price if 150kg of tomatoes were supplied. 1mk
- d) If the price per kg was Kshs. 3.70, how many kilograms of tomatoes would be bought?
1mk
- e) Calculate the elasticity of supply when price changed from Kshs. 7.00 to Kshs. 4.00 per kg of tomatoes. 3mks
- f) Other than change in price, list other factors that will influence the supply of tomatoes in the market. 6mks.
24. Describe the production of tomatoes under the following sub- headings.
- i) Ecological requirements. 4mks
 - ii) Nursery management practices. 6mks
 - iii) Pest and disease control. 6mks
 - iv) Harvesting and marketing. 4mks
25. (a) Describe the establishment of grass pasture from the time the land is ploughed using a mouldboard plough to the time the pasture is ready for grazing.
10mks
- (b) What are the advantages of mixed grass legume pasture over a pure grass pasture?
10mks

SAMPLE PAPER 5

MARKING SCHEME

443/1

SECTION A

1. -Crop production/ crop husbandry
-Animal production/ animal husbandry
-Agricultural economics

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- Agricultural engineering
- Soil science
 - 2. -Crop rotation
- Control soil PH
- Control soil erosion
- Proper drainage
- Control weeds
- Apply fertilizer/ manure
- Minimum tillage
- Use organic mulches
 - 3. -Cutting of tree branches at specific points to attain the desired shape
 - 4. -High interest rates
- Poor returns from agricultural investment
- Rigid payment schedules regardless of level production
- Security demanded is limiting
- Lack of advance to farmers leads to misallocation of funds
 - 5. -High residual effect
- Released slowly thus benefit crop for longer time
 - 6. -Less feeder
- Require little cultivation after establishment
 - 7. -Show history of the farm
- Compare performance in farm enterprises
- Help in insurance claims
- Show profit or loss in a farm
- Help in planning and budgeting
- Show farm assets and liabilities/ value for farm
- 8. -Light intensity
 - Light duration
 - Light wavelength/ quality
- 9.a) -Biotechnology used to clone vegetatively propagated plants
 - b) -Propagate pathogen free plants

- Mass production of propagules
- Fast and requires less space
- 10. -High caffeine content
- Encourages vegetative growth
- Discourages flowering
- 11. -Wool and mutton
- Mutton and skin
- Milk and butter
- Beef and hides
- Honey and wax
- 12. -Variety of crop
- Prevalence of pests and diseases
- market demand
- Rainfall pattern/ moisture content of crop
- 13. -Concentration of herbicide
- Stage of growth of weeds
- Plant anatomy and morphology
- Mode of action
- Environmental factors
- 14. -The tenant may lose in case of no written lease
- the method of rent-payment may discourage the tenant
- 15. -Intensity of defoliation: Proportion of herbage removed through grazing and that of residual forage
- Frequency of defoliation: How often forage stand is grazed / cut for feed
- 16. -Use nitrogen to decompose
- Hence depriving plants off the nitrogen compound
- 17. -Financial statement: These are statement prepared at the end of business year to give financial position
- Financial document: These are business issue by buyer of seller to give legal transaction made
- 18. -Shortage of farm labour

- Low demand of agricultural goods
- Poor development of agriculture
- Low food supply
- A lot of time and resources is used to control the pandemic

SECTION B

19. a) -Weaver bird/ bird
-Rat/ mice
b) -Damage the grains
- Lower quantity of grains/ feed on grain
 - Open husks thus encourage grain rotting
 - c) -Trapping/ keeping cats
 - Clearing vegetation around crop stores
 - Put rat guards on stores
20. a) -Trellising/ tralleying
b) -Wires
- Twine/ sisal strings
 - c) -Easy to carry out crop management practices/ weeding, spraying
 - Effective spray application
 - crop receives adequate light/ suitable micro-climate
 - Avoid contamination of fruits by soil
21. a) -Moving water from one point to where it will be used or stored
b) -Metal pipes
- Plastic pipes
 - Horse pipes
 - c) -Watering animals
 - Domestic purpose e.g. cooking/ washing/ cleaning e.t.c.
 - Irrigating crops
 - Diluting chemicals
 - Processing farm produce
 - Construction of buildings
 - For recreation/ swimming pools

-Rearing fish/ fish ponds

-Cooling engines

22 .a) Production of crops and planting of trees and keeping of livestock in the same field
1mk

b) -Environmental friendly

-Crop products have no inorganic chemical residues

-Affordable and cost effective

-Improves soil structure

-Provides food to soil microbes

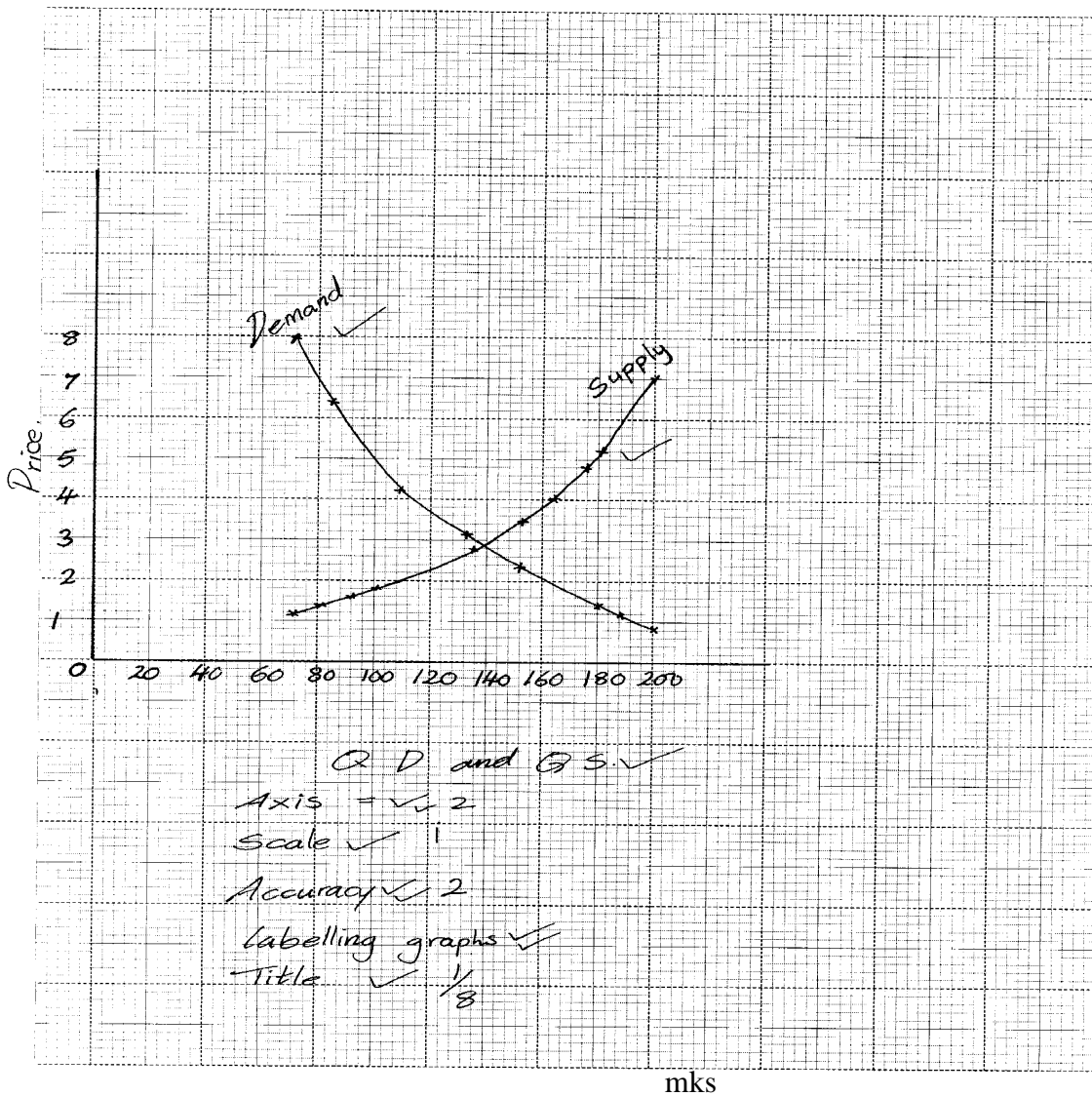
c) -Fast growing

-Highly vegetative

-Add nutrients to soil / legumes

-Grow tall/ avoid competing with crops for light

Graph of supply and demand of tomatoes against price in a town mkt ✓



SECTION C

23. a) Graph paper attached
- b) 2.80 - 2.90 KSH
- c) 3.30 - 3.40 KSH
- d) 120 Kg
- e) $E_d = \frac{\Delta \% S}{\Delta \% P}$

$$\begin{aligned} \text{Supply} &= \frac{200-162 \times 100}{200} \\ &= 19\% \checkmark \end{aligned}$$

$$\begin{aligned} \text{Price} &= \frac{7-4 \times 100}{7} \\ &= 42.86\% \\ \text{Es} &= \frac{19}{42.86\%} \\ &= 0.44 \end{aligned}$$

f) -Number of suppliers/ sellers in market

- Price of related goods ✓
- Price expectation ✓
- Level of technology ✓
- weather ✓
- Government policy ✓
- Cost of production ✓
- Transport system ✓

24. i) -Warm climate ✓
-Altitude 0 -2100m above sea level ✓
-RF 760 -1300mm/ Yr ✓
-Deep, fertile and well drained soils ✓

- ii) -Prepare to fine tilth ✓
-Water nursery twice a day ✓
-Erect shade ✓
-Control pests/ diseases ✓
-Harden off seedlings before transplanting ✓
-Transplant 10cm high/ 4-6wks/ 4-5 time leaves ✓

- iii) Pests and diseases control ✓
-Spray with appropriate chemicals ✓

- Rogueing in case of heavy infestation
- Crop rotation in nematode control✓
- Use certified seeds✓
- Avoid planting in an area recently planted with the same crops✓
- Spray with fungicides✓
- Regular watering to reduce blossom end rot✓
- iv) Harvesting and marketing✓
- Fresh market fruits be picked reddish color✓
- Grade tomatoes according to ripeness✓
- Place in wooden crates to avoid bruising✓
- Transport to market while still fresh✓

25. a) -Harrow the land to fine tilth
- Before onset of rains
 - Clean seedbed / weedfree
 - Select desirable variety
 - Plant at onset of rains
 - Apply phosphatic fertilizers
 - Drill/ broadcast seeds evenly
 - Use a recommended seed rate for the variety
 - Drug a twig/ gunny bag to cover the seeds
 - Control weeds by uprooting/ applying a suitable herbicide
 - Apply nitrogenous fertilizers about 6wks after germination
 - Cut back/ practice light grazing
 - Avoid grazing when pasture is too young
 - Use certified seeds/ healthy seeds
- b) -More palatable than pure grass
- Farmer has security against total loss
 - Mixed pastures yields higher
 - More nutritious
 - Makes maximum use of soil nutrients

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- Has better weed control
- Reduce soil erosion
- Increases soil fertility
- Economizes on use of nitrogenous fertilizer
- Better distribution of growth

SAMPLE PAPER 6

443/1

AGRICULTURE

SECTION A (30 Marks)

Answer all the questions in this section in the spaces provided

1. Give one reason why Agriculture is regarded as a science. 1mk
2. Give two reasons why ranching is important in the arid and semi arid areas of Kenya. 2mk
3. Give two importance of living organisms in soil formation. 1mk
4. Give two advantages of organic farming in relation to environmental conservation. 1mk
5. (a) Give two advantages of ridging in crop production. 1mk
(b) Give one reason in each case for carrying out the following operations in crop production? 2mks
 - i) Levelling
 - ii) Rolling(c) State two farming practices that are carried out in minimum tillage. 1mk
6. (a) Define the term pollution. 1mk
(b) Give two agricultural practices, which will lead to water pollution. 1mk
(c) List two methods used to prevent water pollution. 1mk
7. Give two importance of keeping health records. 1mk
8. (a) State two importance of organic matter in the soil. 1mk
(b) State two problems associated with the use of manures by small-scale farmers. 1mk
(c) Give two factors considered when siting compost manure on the farm. 1mk

9. (a) State two factors to consider when choosing seed rate. 1mk
(b) Give two reasons for using certified seeds for planting. 2mks
(c) Given that maize is planted at a spacing of 75cm x 25cm. Calculate the plant population in a plot of land measuring ½ ha . (Show your working). 2mks
10. (a) List two factors that determine the number of times a farmer would harrow his land. 1mk
(b) Give one reason why it is not advisable to use excess organic manure in the growing of carrots. 1mk
(c) Calculate the number of 50kg SA fertilizer bags that would be applied in one hectare of land that requires 60kg of Nitrogen per hectare. SA fertilizer contains 20% Nitrogen. 2mks

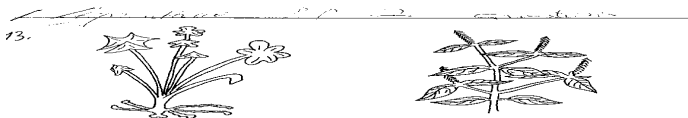
(Show your working)

11. (a) Define the following terminologies as used in Agriculture. 1mk
i) Seed inoculation 1mk
ii) Chitting. 1mk
iii) Tipping. 1mk
12. a) Define the term opportunity cost 1mks
b) Under what farming conditions is opportunity cost zero? 1mk

SECTION B (20 MARKS)

Answer ALL the questions in this section in the spaces provided.

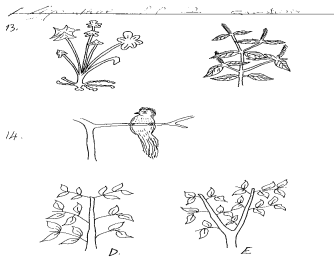
13.



- b) Identify the weeds illustrated in diagrams A and B 1mk
b) State one reason why the weed labeled A is difficult to control. 1mk

c) State two economic importance of the weed labeled B in Agriculture. 1mk

14. The diagram below shows a crop pest.

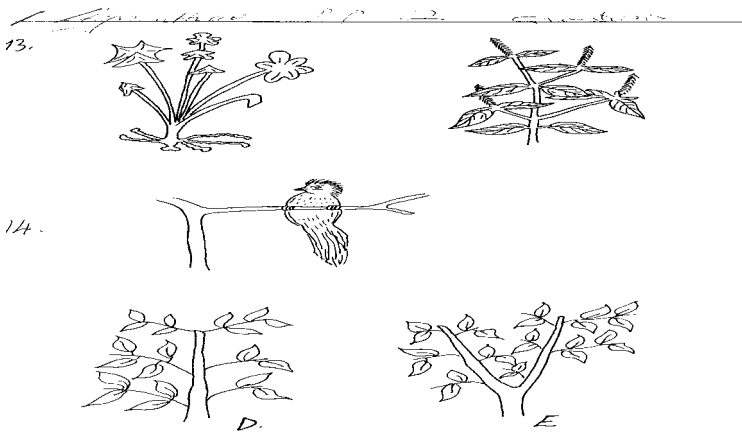


a) Identify the crop pest ½ mk

b) State two damages the pest would cause to crops. 1mk

c) State one cultural control measure for the pest labelled C 1mk

15. The diagrams below show pruned coffee.

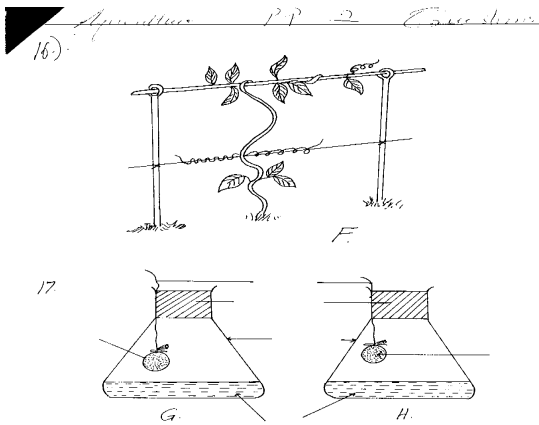


(a) Name the systems of pruning illustrated in D and E. 1mk

(b) Outline how the pruning system in the diagram E is carried out. 2mks

(c) Give two advantages of the pruning system illustrated in diagram D over the pruning system illustrated in diagram E. 2mks

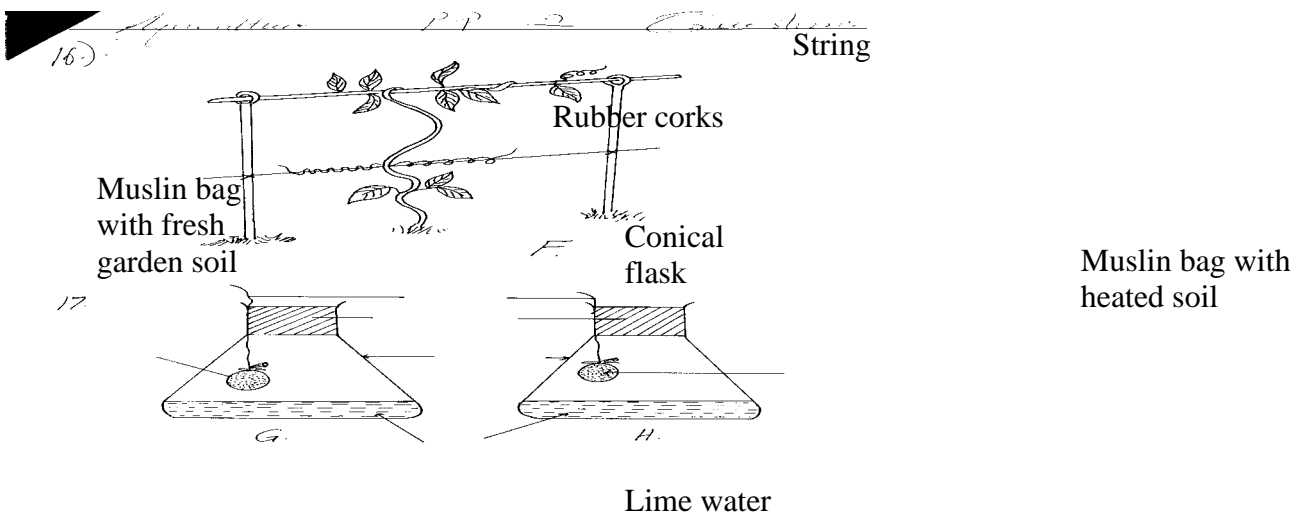
16.



(a) The diagram F, above illustrates a method of training in crops.

- i) Identify the method shown in F above. ½ mk
- ii) Name two other methods used in training in crop production. 1mk
- iii) State two advantages of training in crop production. 1mk
- iv) List two crops that require training. 1mk

17. Study the diagrams labelled G and H



- (a) Give one use of setting up such an experiment. 1mk
- (b) Give two reasons why the garden soil in experiment H is heated. 2mks
- (c) Briefly explain what happens to the lime water in both experiments G and H

- Experiment G 1mk
Experiment H 1mk
d) Give one reason for your answer in Question 17(c) above. 1mk

SECTION C (40 MARKS)

Answer ANY TWO Questions in this section in the spaces provided in this booklet

18. Describe the field production of either maize, sorghum or finger millet under the following sub-headings.

- a) Seedbed preparation 4mks
b) Planting. 6mks
c) Field management practices. 7mks
d) Harvesting. 3mks

19. The table gives information on the supply of potatoes in a local market.

| Price /bag in Kshs. 1000 | Quantity Demanded (in bags) | Quantity supplied (in bags) |
|--------------------------|-----------------------------|-----------------------------|
| 1 | 20 | 2 |
| 2 | 15 | 8 |
| 3 | 12 | 12 |
| 4 | 10 | 16 |
| 5 | 9 | 19 |

- i) using a suitable scale and on the same axis, draw and label supply and demand curves using the data given. 8mks
 - ii) From the curves drawn, what is the price per bag when 15 bags of potatoes were supplied? 1mk
 - iii) How many bags of potatoes were supplied at Equilibrium price. 1mk
 - iv) What factors would affect the supply of potatoes in a local market? 8mks
 - v) Differentiate between a perfect and imperfect market as used in Agricultural economics. 2mks
20. a) What is Agro-forestry? 2mks
- c) Name the main forms of Agro-forestry land use systems. 3mks
 - d) Outline the importance of Agro-forestry in agriculture. 6mks
 - e) Give the characteristic of ideal Agro-forestry tree species. 9mk

MARKING SCHEME

SAMPLE PAPER 6

443/1

AGRICULTURE

SECTION A (30 MARKS)

1. It requires scientific know how to carry out operations such as pest and disease control, soil fertility maintenance, selection and breeding e.t.c

2.
 - Animals can survive and do well in areas where crop production is not possible
 - Pasture improvement in these areas help to increase the land carrying capacity
 - Animals can be moved with ease inside an enclosed area in search of food and water
 - Helps relieve population pressure in high potential areas/ it is an important way of earning a livelihood in dry areas

3.
 - Decompose organic matter to humus
 - Fix nitrogen in the soil
 - Provide nutrients in the soil when they die
 - Their waste matter adds nutrients to the soil
 - Their burrowing activities increase the breakdown of rock particles
 - Plant root's breakdown rocks as they grow and expand
 - Plant leaves decay to form organic matter
 - Plant roots hold the soil firmly preventing soil erosion
 - Large animals break rock particles increasing the process of weathering

4.
 - Production of healthy products which do not have any chemical residue
 - It prevents chemical pollution of water sources
 - It enhances conducive environment for the multiplication of useful soil organisms
 - Organic matter acts as food for soil organisms

5. **Ridging**
 - a)
 - It encourages root development and expansion
 - It helps to conserve soil and water
 - It makes harvesting of root crops easy

 - b)
 - i) **Levelling**

- Encourages uniform depth of planting
 - Facilitates uniform germination of seeds
 - Prevents depression that collect too much water which leads to rotting of seeds

ii) **Rolling**

- Reduces wind erosion
- Reduces evaporation
- Makes the seeds to be in contact with soil
- Allows fine tilth

c) **Minimum tillage**

- Application of herbicides in controlling weeds
 - Use of mulch on the soil surface
 - Timing cultivation
 - Restricting cultivation to the area where seeds are to be planted
 - Establishing a cover crop on the field
 - Uprooting or slashing weeds in perennial crops

6. a) - Any process which leads to harmful increase in the amount of chemical substances or form of energy released into the environment by human activities

- b) - Use of inorganic fertilizers
- Use of pesticides
 - Poor cultivation practices e.g. over cultivation, over grazing, cultivation along river banks

- c) - Soil conservation measures
- Fencing of water sources
 - River banks should be vegetated by planting grass/ sugarcane e.t.c.

- Employing adequate storm water control methods and disposal systems
- 7.
 - Help in culling sickly animals (reject culling sick animals)
 - Help in selection of animals for breeding
 - Help in calculation of veterinary/ treatment cost
 - Assist the farmer in knowing the prevalent diseases
- 8. a)
 - Releases plant nutrients on decomposition thus increasing fertility
 - Improves soil structure
 - Improves soil water holding capacity
 - Regulates soil temperature
 - Increases microbial activities in the soil
 - reduces the built up of toxic substances
 - Moderates soil PH
- b)
 - Bulkiness- low nutritive value per unit volume
 - Laborious in application and transport
 - They spread diseases, pests and weeds
 - If used when not fully decomposed, the crop does not benefit from them
- c)
 - Well drained place
 - Direction of the prevailing wind
 - Size of the farm
 - Accessibility
 - Nearness to where it has to be used
- 9. a)
 - Seed purity

- Germination percentage
- Spacing
- Number of seeds per hole
- The purpose of the crop

- b)
- For increased crop yields
 - Higher resistance to diseases
 - Good adaptation to recommended ecological zones
 - Reduced spread of pests and diseases

- c) Plant population=Area x No. of seeds per hole✓

Spacing

$$\text{Area} = \frac{1}{2} \times 10,000\text{m}^2 = 5,000\text{m}^2$$

$$\text{No. of seeds per hole} = 1$$

$$\text{Spacing} = 0.75\text{m} \times 0.25\text{m}$$

$$= \frac{5000\text{m}^2}{0.1875\text{m}^2} = 26,667$$

$$0.75\text{m} \times 0.25\text{m} = 0.1875\text{m}^2$$

$$= 26,667 \text{ plants}$$

10. a)
- The crop to be grown/ size of the seed
 - Slope of the land
 - Condition of the land after primary cultivation
 - Moisture content of the soil
 - Type of implement used
 - Type of soil

- b)
- It causes forking in carrots

c) % of N in SA fertilizer = 20%

Amount of N required = 60Kg/ ha

Let the amount of SA fertilizer needed be = x

20% of x = 60Kg N

$100 \times 20 / 100x = 60 \text{Kg} \times 100$

$X = \frac{60 \times 100}{20}$ ✓

20

= 300Kg.SA ✓

No. of bags will be = $\frac{300}{50}$ = 6 bags ✓

50

11. a) i) **Seed inoculation**

- The treatment of legume seeds with a Nitro-culture/ artificial bacteria to increase their Nitrogen fixation in the soil, if grown in Nitrogen deficient soils

ii) **Chitting**

- Breaking of dormancy in Irish potatoes before planting

iii) **Tipping**

- Removal of 3 leaves and a bud from each shoot above the required height of the table in tea during plucking table formation/ formation of a uniform and flat plucking table in tea

12. a) - Returns from the best alternative foregone

b) - Opportunity cost does not exist where there are no alternatives

SECTION B (20 MARKS)

13. a) A- Oxalis/ Oxalis Latifolia/ Oxalis spp

B – Devils Horse Whip/ Achyranthes aspera /Achyranthes sp

b) A has underground storage structures that regenerate easily

c) B – It's a weed in annual crops

-it irritates farm workers reducing their efficiency

14. a) C – Mouse bird

b) - Destroys grains in cereals

- Destroys fruits e.g. tomatoes

c) - Growing resistant varieties such as goose – necked sorghum

15. a) D – Single stem pruning

E – Multiple stem pruning

b) - The main stem of the seedling is capped to encourage suckers to grow

- Two to three suckers are selected and allowed to grow while the rest are removed

- c) - It is more convenient to work on the plant
 - There is less frequent change of cycle
 - There is easier passage of chemicals during spraying
 - Minimum breakage of branches/ strong frame work
16. a) i) -Trellising method
- ii) - Staking
- Propping
- iii) - Production of clean fruits
- Facilitates spraying and harvesting of the crops
- Controls incidences of disease outbreak
- Prevents infestation by soil – borne pests
- iv) - Passion fruits
- Tomatoes
- Garden peas
- Some bean varieties
- Bananas
17. a) To test for the presence of living organisms in the soil
- b) To kill any living organisms present in the soil
To remove carbon dioxide
- c) G – the lime water forms a white precipitate/ turns milky/ turns whitish
- H – The lime water remains clear

- d) - Living organisms breathe out CO₂ which reacts with lime water to form a white precipitate

SECTION C (40 MARKS)

18. a) **Maize**

Seedbed preparation

- Prepare the seed bed early during the dry season to kill weeds
- Prepare the land well to kill perennial weeds e.g. couch grass
- Do one or two primary cultivations
- Harrow the land to a fair/ medium tilth
- Plough along the contours to reduce soil erosion
- Prepare the land using a tractor – drawn disc plough/ mould board

plough

Planting

- b) - Plant at the beginning of the rains
- Dry planting can also be done two weeks before the rains
- Space according to the cultivar/ variety/ plant at 75-90cm x23-30cm
- Plant 1 to 2 seeds per hole
- Plant at a depth of 2.5 to 10cm depending on the soil moisture content
- Plant certified seeds from reliable dealers
- Place seeds more shallowly in moist soils and deeply in dry soils
- Plant by hand on small farms/ use tractor – drawn planters on large scale farms
- Use phosphatic fertilizers at planting time
- Apply phosphatic fertilizer at a rate of 120Kg/ ha

Field management practices

- c)
 - Top dress with nitrogenous fertilizers at 45-60cm tall
 - Keep the field weed free during early stages
 - Weeding can be done manually or using herbicides
 - Use selective herbicides e.g. 2, 4 -D and MCPA
 - Weed 2 to 3 times if done manually
 - Thin the seedlings to 1 seedling per hole at 15cm height
 - Remove all the tillers when plants are 15cm tall
- Control pests such as maize stalk borer and army worms using appropriate insecticides
 - Uproot and destroy diseased plants to avoid spreading the disease to healthy ones

Harvesting

- d)
 - Harvest after 3 ½ - 9 months
 - Harvest when the whole plant turns yellow and the ears are dry
 - Harvest when the plants have a moisture content of 15-25%
 - Harvest by hand if small scale/ use combine harvesters in large scale
 - Cut and stook the maize for further drying if harvesting manually
 - Remove the maize cobs from the husks by hand
 - Shell, winnow and dry to a moisture content of 12% before storing

Sorghum

a) Seed bed preparation

- Prepare the seedbed early during the dry season to kill weeds
- Prepare the land well to kill perennial weeds such as couch grass
- Do one or two primary cultivation
- Use ox -ploughs if on small scale/ use tractor drawn ploughs on large scale
- Harrow the land to a fine tilth

b) Planting

- Plant at the beginning of the rains
- Dry plant where possible
- Use certified seeds for planting
- Broadcast the seeds evenly and cover lightly with soil
- Row planting can be done
- Plant at a spacing of 45-90cm x10-60cm
- Plant at 2.5-5.0cm deep
- Wheat drills can be used for planting
- Use a seed rate of 2-15Kg/ ha
- Place an average of 3 seeds per hole
- Use single super phosphate at a rate of 100-200Kg/ ha

c) **Field management practices**

- Top dress with CAN at a rate of 1000Kg/ ha
- Top dress three weeks after planting
- Control the weeds early before they establish
- Use mechanical weeding/ herbicides e.g. 2, 4 -D
- Control the witch weed before it flowers
- Thin the plants when 15cm tall
- Thin to 1 to 2 seedlings per hole
- Use resistant varieties/ bitter type/ goose neck type to avoid birds e.g. Quelea/ scare/ chase the birds
- Use crop hygiene and other appropriate cultural measures to control diseases such as smuts and anthracnose

d) **Harvesting**

- Takes about 2-9 months to mature
- Harvest when the moisture content is about 15% when the whole plant has completely dried
- Harvest manually by cutting heads with a sharp panga or knife
- Combine harvesters can be used on large scale

- Store before or after threshing
- Dry further to reduce the moisture content to 10-11%

Finger millet

a) Seed bed preparation

- Prepare the seed bed early during the dry season to control weeds
- Remove all perennial weed
- Prepare the land to a fine tilth/ harrow severally to obtain a fine tilth
- Incorporate large amounts of organic manure as you prepare the land
- Prepare the land using tractors/ ox – plough
- Ensure the organic manure is thoroughly mixed with the soil

b) Planting

- Plant early at the beginning of the rains
- Dry planting can be done the same month the rains are coming
- Broadcast by hand/ drill in shallow furrows
- Cover the seeds lightly with soil
- Ox – seeders can be used
- Space at 30-33cm x5cm/ 5.5-9.0 Kg/ ha seed rate/ broadcast at a rate of 35Kg/ ha of seeds

c) Field management practice

- Thin to 5cm apart if row planting was used
- Top dress with sulphate of ammonia
- Control weeds using an ox – weeder if planted in rows/ uproot any weeds that come up
- Apply sulphate of ammonia fertilizer at a rate of 125Kg/ ha
- Top dress when the crop is 15cm high
- Control birds by scaring them off
- Plant resistant varieties to control head blast disease

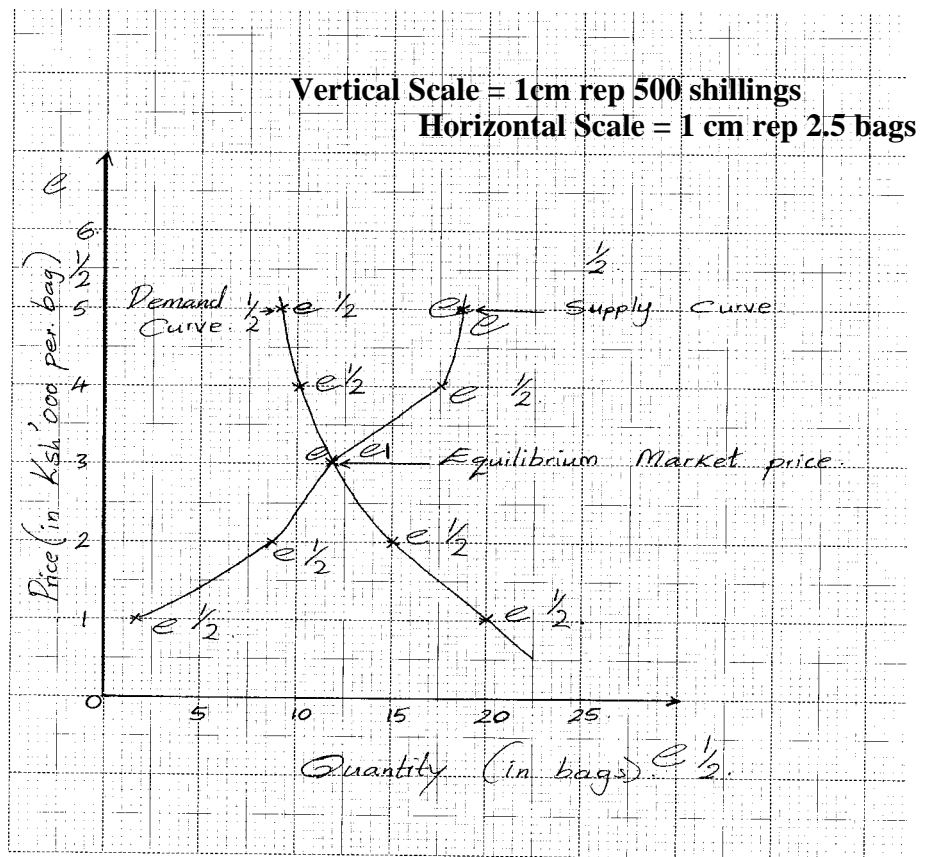
d) Harvesting

- Harvest when the crop and the head is dry

- Use small hand knives to cut off the heads
- Store the heads without threshing
- Combine harvesters can also be used if on large scale

19. i)

GRAPH SHOWING THE SUPPLY AND DEMAND CURVES FOR POTATOES IN



A LOCAL MARKET

- ii) 3,750 (Three thousand seven hundred and fifty)
- iii) At equilibrium, 12 bags were supplied
- iv) - The price of potatoes
- Price of related goods
- Cost of production
- Technology
- Price expectation
- Government policy
- Weather changes

- Time lag between production process and availability of produce

v) A perfect market is one where the buyer and consumers are aware of the prices offered on the market whereas an imperfect is where some buyers and some sellers are not aware of the prices/ market conditions

20. a) The growing of crops, pastures and trees/shrubs on the same piece of land/ the growing of

crops, keeping of livestock and growing of trees/ shrubs on the same piece of land

- b) - Trees grown in association with pastures or livestock/ silvo pastoral
- Trees in association with crops and livestock or pastures/ agrisilvi pastoral
- Trees grown in association with crops/ agrosilviculture
- c) - Protection of soil/ erosion mental protection
- Afforestation
- Labour saving
- Source of food and feed/ fodder
- Source of income
- Aesthetic value
- Maintenance of soil fertility
- d) - Nitrogen fixing ability
- Fast growing
- Multipurpose nature
- By – product production
- Deep rooted with a narrow root zone
- Non- competitive ability with main crops
- Appropriate canopy

- Nutritious and palatable
- Easily coppiced/ able to grow after cutting/ pruning

SAMPLE PAPER 7

443/ 1

SECTION A (30 Marks)

Answer all the questions in this section in the spaces provided

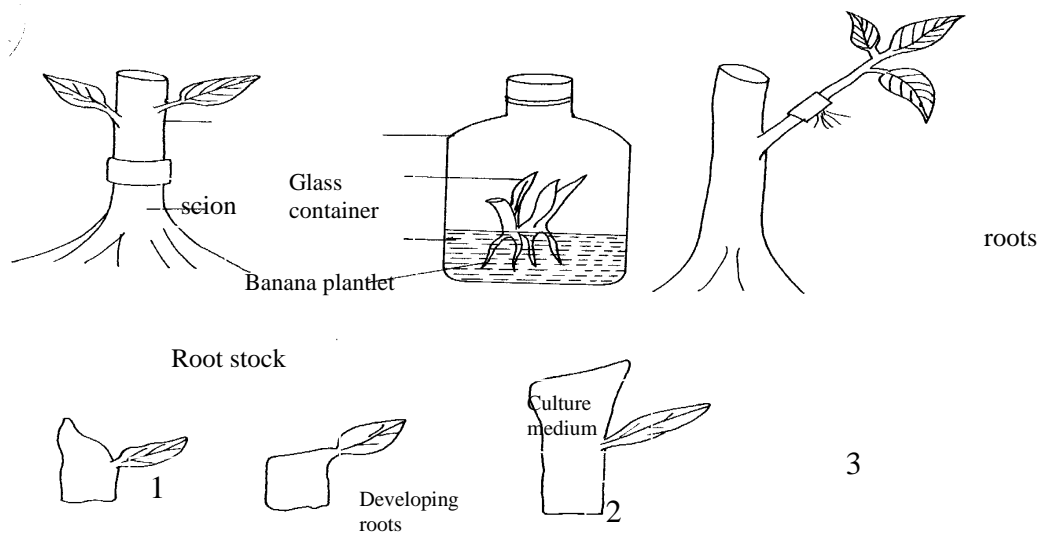
1. Give four functions of phosphorous to crops.
2mks
2. What is a companion crop. 1mk
3. Give four factors a farmer should consider when designing a crop rotation programme.
4mks
4. Distinguish between land settlement and land resettlement.
2mks
5. Name two types of credit given to farmers in Kenya. 2mks
6. Give three importance of early sowing of annual crops during planting season.
3mks
7. Name two disease of bulrush millet.
2mks
8. Give two financial statements a farmer may prepare on a well organized farm.
2mks
9. Give two reasons why it is advisable to top dress maize with nitrogenous fertilizer at knee high. 2mks
10. Give two advantages of planting maize with correct plant population. 2mks
11. Give three characteristics of a good rootstock for grafting.
3mks
12. State three effects of HIV/AIDS to agriculture production in Kenya. 3mks
13. State two ways in which soil structure influence crop production.
2mks

SECTION B (20 MARKS)

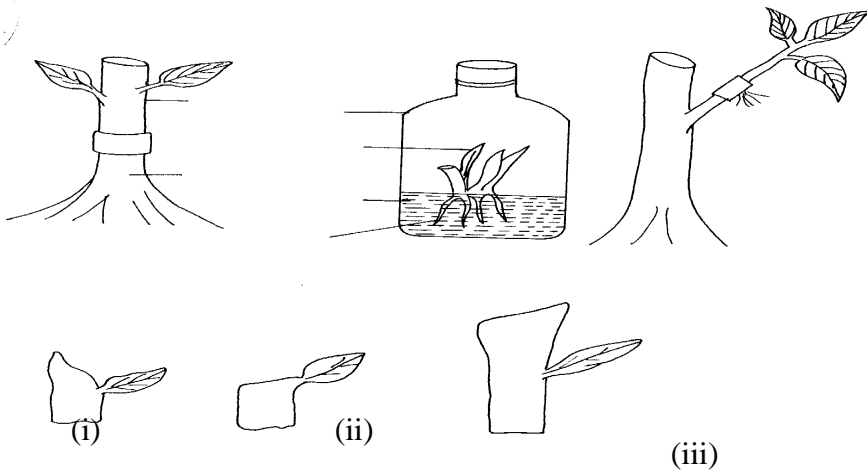
Answer ALL the questions in this section in the spaces provided.

14. Study the methods of crop propagation illustrated below and answer the questions that follow

14. Study the methods of crop propagation illustrated below and answer the questions that follow



- a) Identify the methods of crop propagation illustrated above. 1 ½ mks
 - b) Give one condition under which method (1) above is carried out. ½ mk
 - c) State two disadvantages of using stem cuttings for planting. 1mk
15. a) Apart from damage by birds, name two other serious pests which can attack sorghum crop while still in the field. 2mks
- b) Give two methods used in controlling birds in a field planted with sorghum. 2mks
- c) Give three reasons why sorghum for silage making should be harvested just before flowering stage. 3mks
16. Agriculture students made the following pruning cuts on citrus in their orchard using secateurs.



- (a) Give one reason in each case why the above methods of cutting were incorrect. 3mks
 b) State three different ways by which pegging can be carried out in tea.
 3mks

17. The table below shows output of maize in response to increase in D.A.P fertilizers on one hectare of land.

| Fixed input land (in ha) | Variable input D.A.P in 30kg-bag | Total product maize yield in 90-kg bag | Average product (AP) maize in 90kg bag | Marginal product (M.P) in 90kg bag |
|--------------------------|----------------------------------|--|--|------------------------------------|
| 1 | 0 | 2 | - | - |
| 1 | 1 | 5 | - | - |
| 1 | 2 | 14 | - | - |
| 1 | 3 | 21 | - | - |
| 1 | 4 | 26 | - | - |

- a) Fill in the table for average product (A.P) and marginal products (M.P)
 4mks

SECTION C (40 MARKS)

Answer ANY TWO Questions in this section in the foolscaps attached.

18. Describe the production of maize for grain from land preparation to harvesting.
 20mks
19. a) Explain two reasons for treating water in the farm. 2mks
 b) Name four types of water pumps which can be used on a farm. 4mks

- c) List two features of plastic pipes a farmer should consider before buying the pipes 2mks
- d) Describe the processes involved in water treatment using a chemical treatment system before pumping it to the farm. 12mks
20. a) Give one reason in each case why it is difficult to control the following weeds.
- i) Oxalis
 - ii) Nut grass
 - iii) Couch grass 3mks
- b) State two main factors which contributes to competitive ability of weeds. 2mks
- c) State five safety measures that a a farmer must consider to prevent danger to other people and environment when using herbicides. 5mks
- d) Describe any five cultural methods of controlling weeds. 10mks

SAMPLE PAPER 7

MARKING SCHEME

443/ 1

MARKING SCHEME.

1. Functions of phosphorus

- i) Formation and development of roots
- ii) Strengthens straw in cereals
- iii) Important in metabolic processes e.g respiration, photosynthesis
- iv) It is essential for flowering, fruiting and seed formation
- v) Increases the size of the grains.

2. A crop grown in the field to help suppress weed growth and control erosion

3. i) Maintain soil fertility

- ii) Nutrients at different soil depths are used
- iii) Reduces chances of soil erosion
- iv) Controls crop pests and diseases
- v) Parasitic weeds can be controlled e.g. striga weed
- vi) Improves soil structure
- vii) Legume plants assist in fixing nitrogen in the soil
- viii) There is uniform distribution of labour throughout the year
- ix) Herbicides can be used to control weeds when crops are individually planted in separate plots

4. Settlement – Is the occupation of land which was previously uninhabited.

Resettlement- Is the movement of people from highly populated areas to sparsely populated areas

5.
 - i) Short term
 - ii) Medium term
 - iii) Long term

6.
 - i) Enable the crop to establish early to withstand competition from weeds
 - ii) It allows better utilization of available rainfall
 - iii) Enables the crops to escape attack by most pests and diseases
 - iv) For better utilization of available nutrients
 - v) To utilize nitrogen flush
 - vi) To get high prices at the market
 - vii) It reduces labour competition

7.
 - i) Downey mildew
 - ii) Rust
 - iii) Smuts
 - iv) Ergot

8.
 - i) Balance sheet
 - ii) Profit and loss account
 - iii) Cash analysis
 - iv) Cash book

9. At this height maize has well- developed roots to absorb dissolved nitrogenous fertilizer

10.
 - i) To obtain high quality crops
 - ii) To obtain high yields
 - iii) Helps a farmer to carry out other cultural practices like weeding, pest and diseases control
 - iv) Reduce competition for light and nutrients

11. i) Healthy
ii) Compatible
iv) Resistant to soil borne diseases and pest
v) Adaptable to different soil conditions
12. i) Direct loss due to death of the farmer or farm workers
ii) Time loss in seeking medical attention
iii) Loss of resources e.g. Money spend in Medication
iv) Loss of motivation or interest to develop the farm
13. i) Influence pore spaces in the soil
ii) It influence air circulation
iii) It influence micro- organism in the soil
iv) It influence water holding capacity of the soil.

SECTION B

- 14.a) i) Whip / tongue grafting
ii) Tissue culture / banana tissue culture
iii) Aerial layering / marcotting
- b) When the root stock have the same diameter as a scion
- c) i) Stem cuttings does not results in new crop varieties
ii) Stem cuttings cannot be stored for long
iii) It is difficult to keep stem cuttings tree from diseases
- iv) Stem cuttings are bulky to transport
15. a) i) Stalk borers
ii) Sorghum shoot fly
iv) Midges

- b)
 - i) Planting resistant variety / planting bitter variety goose necked types
 - ii) Physically scaring / use of scare crow / chasing by throwing stones.

- c)
 - i) It has highly dry matter content
 - ii) Easily digestible
 - iii) High leaf; stem ratio
 - iv) High soluble carbohydrates for fermentation
 - v) Has high moisture / succulent
 - vi) Has optimum nutrients

- 16.a)
 - i) The cut is sloping the wrong way
 - ii) The cut is too close to bud
 - iii) The cut is too far from bud

- b)
 - i) Use of individual hooked pegs
 - ii) Use of rings and pegs
 - iii) Use of parallel sticks / fitoes and pegs

17.

| Variable input fertilizers | Average product (maize in 90kg bag) | Marginal product m.p in 90kg bags |
|----------------------------|-------------------------------------|-----------------------------------|
| 0 | 0 | 2 |
| 1 | 5 | 3 |
| 2 | 7 | 9 |
| 3 | 7 | 7 |
| 4 | 6.5 | 5 |

SECTION C

18. Land Preparation

- i) Prepare land in dry period / early / before onset of rain

- ii) Clear land, /all stumps remove /remove perennial weeds
- iii) Land is ploughed,/carry out primary cultivation
- iv) Harrow the land/ carry out secondary cultivation

Planting

- v) Dry planting / Early planting /planting at onset of rain
- vi) Select suitable variety / certified seeds
- vii) Depth of planting 2.5cm – 10cm deep
- viii) Planting with phosphatic fertilizers DAP, / S.S.P, / D.S.P / TSP/
- ix) Rate of P₂ O₅ should be 120kg / ha / 100- 150kg /ha DSp
- x) Spacing of 75- 90cm by 23-50cm
- xi) Plant 1-2 seeds per hole
- xii)

Field operation

- xiii) Gapping should be done
- xiv) Thinning / removal of tillers is done
- xv) Weed control is by tillage / uprooting / use of herbicide
- xvi) Nitrogenous fertilizers/ CAN is used to top dressed / 200 kg /ha of A.S.N
- xvii) Top dressing done at 40- 60cm / knee high
- xviii) Rate of nitrogen should be 200kg / ha
- xix) Stalk bores, armyworms should be controlled using appropriate methods
- xx) Diseases like maize streak are controlled by uprooting and burning affected plant
- xxi) Harvested when dry 14- 28% D.M content
- xxii) Stalks are cut and stoked in the field
- xxiii) Cobs are removed by hand and placed in store / de-husked
- xxiv) Harvestive is done when moisture content is 20%

- 19.a)
- i) To kill diseases causing micro-organism of bacteria, protozoa / pathogens
 - ii) To remove chemical impurities e.g. fluoride
 - iii) To remove smell and bad taste
 - iv) To remove sediments of solid particles

- b) i) Centrifugal / Rotodynamic pumps
ii) Piston / Reciprocating pumps
iii) Semi-rotary pump
iv) Hydram
v) Rotary
- c. i) Durability
ii) Size (diameter)
iii) Costs
- d. i) Filtration at intake ; Water passes through a series of sieves, removal of large particles of impurities
ii) Softening of water;- Water is mixed with soda ash (sodium Bicarbonate) – to soften the water
iii) Coagulation and sedimentation:- Adding of Alum (aluminum sulphate) to facilitate coagulation and sedimentation. Water stays in the tank for 36hrs to kill bilharzia
-Tanks are left open for aeration to remove bad smell
iv) Filtration:- Water is filtered to remove solution particles
v) Chlorination: Addition of small amount of chlorine solution to kill micro-organism
vi) Storage – Stored in large tanks to await distribution
20. i) Oxalis: has underground bulbs which regenerates
ii) Nut grass:- has nuts / tubers / bulbs underground from which it propagates itself
iii) Couch grass:- has underground rhizomes / stems which are difficult to control because they easily regenerates.
- b)i) Weeds have extremely successful mean of propagation
- Produce large quantities of seeds.
 - Remain viable in soil for along time
 - Easily dispersed
 - Propagate vegetative
- ii) Weeds are excellently adapted to the environment
- 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.

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

SAMPLE PAPER 8

443/1

SECTION A (30 MARKS)

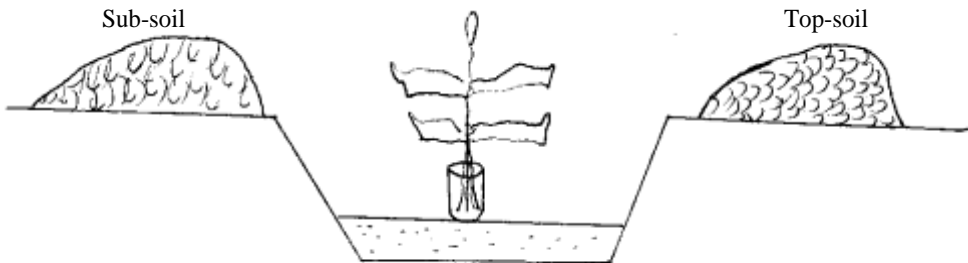
Answer ALL the questions in this section.

1. **State four** effects of high temperature on crop production. (2mks)
2. **Give two** ways of reducing soil acidity. (1mk)
3. **Differentiate** between Extensive and Intensive farming systems. (1mk)
4. **State two** characteristics of a Mother plant where stem cuttings should be obtained (1mk)
5. **What** is lease hold land tenure system (1mk)
6. **State three** reasons why it is necessary to treat water before use. (1½mks)
7. **Define** the term Gross Domestic Product. (1mk)
8. **State two** types of Labour records. (1mk)
9. **Name four** ways in which farmers may maintain soil fertility. (2mks)
10. **Differentiate** between a weir and a dam. (1mk)
11. **List four** effects of weeds on pastures. (2mks)
12. **State three** ways of improving Labour productivity. (1½mks)
13. **State four** reasons which necessitate pruning of tomatoes. (2mks)
14. **Name two** methods of budding. (1mk)
15. **What** do the figures 5 and 3 represent in the maize variety hybrid 513? (1mk)
5:
3:
16. A cow weighs 350kg. she requires 3kg of Dry matter for every 100kg Of body weight Per day. **Calculate** the amount of Dry matter that she requires for a period of 30 days.(Show your working) (1½mks)
17. **State two** advantages of tissue culture in crop production. (1mk)
18. (a) **What** is the causal organism of anthracnose disease of beans? (½ mk)
(b) **State three** control measures of the disease. (1½mks)
19. **What** is opportunity cost? (1mk)
20. (a) **List three** factors a farmer should consider in selecting the correct implements for primary cultivation. (1½mks)
(b) **Name two** types of records a coffee farmer should keep. (1mk)
(c) **Give four** farming practices that helps to reduce water stress in crops. (2mks)

SECTION B (20MARKS)

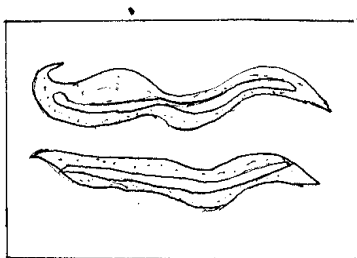
Answer ALL questions on this section in the spaces provided.

21. The diagram below represents an activity during the transplanting of a tea seedling.



Briefly explain step by step how the above seedling can be transplanted in the hole that has been dug in the main seedbed. (5mks)

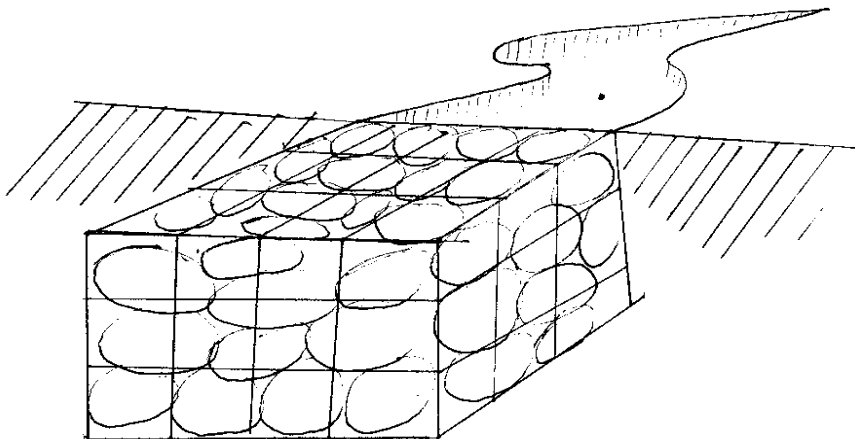
22. (a) **Identify** the crop pest below. (1mk)



(b) **State two** damages caused by the above pest on crops. (2mks)

(c) **Give two** classifications of pesticides based on target pest. (2mks)

23. **Study** the diagram below and answer the following questions.

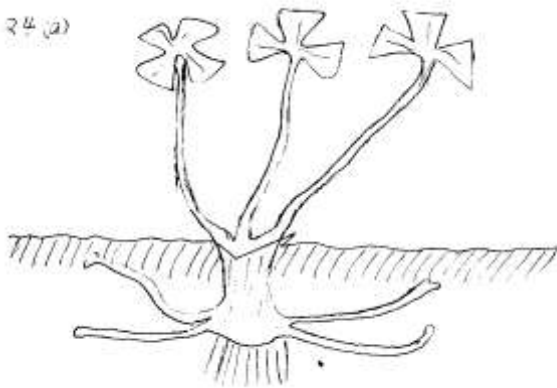


Identify the above method of soil and water conservation. (1mk)

a) **List three** materials used in construction of the above structure.
(3mks)

b) **State two** factors that determine the size of the structure above.
(2mks)

24. (a) **Identify** the weed below. (1mk)



(b) **Briefly explain** why it is difficult to eradicate the weed above in a crop field. (2mks)

(c) **What** are the **two** possible herbicides that can be used in the control of the above weed?
(1mk)

SECTION C

Answer any two questions from this section (40 mks)

25. **Discuss** production of cabbages under the following headings.

(a) Ecological requirements. (3mks)

(b) Planting (6mks)

(c) Pests and diseases control. (5mks)

(d) Harvesting. (6mks)

26. (a) **Discuss** the factors to consider when drawing a farm plan.

(14mks)

(b) **Explain** the ways in which factor inputs are combined by farmers to maximize profits.

(6mks)

27. (a) **Describe** the physical methods of controlling crops pests.

(8mks)

(b) **Explain** the aspects of rainfall which influence agriculture.

(6mks)

(c) **Describe** the preparation of compost manure using FOUR-HEAP method.

(6mks)

SAMPLE PAPER 8

MARKING SCHEME

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SECTION A (30 MKS)

1 State four effects of high temperature on crop production.

- ❖ Increase incidence of diseases and pests.
- ❖ Increase rate of growth.
- ❖ Increase evaporation
- ❖ Improve quality of crops.

2 Give two ways of reducing soil acidity.

- ❖ Apply a basic fertilizer
- ❖ Apply sulphur
- ❖ Apply lime

3 Differentiate between extensive and intensive farming systems.

- ❖ Extensive farming involves carrying farming activities on large portions of land with low capital, labour and management while intensive farming is characterized by use of much labour, huge capital and high managerial skills.

4 State two characteristics of a mother plant where stem cuttings should be obtained.

- ❖ High yielding
- ❖ High leaf quality
- ❖ Good rooting ability
- ❖ Adapts easily to a wide range of ecological conditions

5 What is lease hold land tenure system?

- ❖ Lease hold is a tenure system whereby the state gives legal rights to individual to own and use land for a certain period of time.

6 Reasons for water treatment.

- ❖ To remove sediments
- ❖ To remove chemical impurities
- ❖ To kill diseases-causing micro-organisms.
- ❖ To remove smells and bad taste

7 GDP is the total amount of goods and services produced by a country within a period of one

Year.

8 *labour records:*

- ❖ Labour utilization analysis.
- ❖ Muster roll

9 *Name four ways in which farmers may maintain soil fertility.*

- ❖ Control soil erosion
- ❖ Proper drainage
- ❖ Crop rotation
- ❖ Weed control
- ❖ Use of inorganic fertilizers
- ❖ Inter-cropping
- ❖ Use of manure
- ❖ Minimum tillage.

10 *Differentiate between a weir and a dam.*

- ❖ A weir is a barrier constructed across the river to raise the water level and still allow water to overflow it while a dam is a barrier constructed across a river or a dry valley to hold water and raise its level to form a reservoir or a Lake.

11 *List four effects of weeds on pastures.*

- ❖ Reduce quantity and quality of herbage.
- ❖ Interfere with forage fertilization.
- ❖ Reduce life span of pastures.
- ❖ Compete with forage crops for moisture nutrients and sunlight.
- ❖ May result in livestock poisoning and tainting of products e.g. thorn apple and Mexican marigold respectively.

12 *State three ways of improving labour productivity.*

- ❖ Training
- ❖ Labour supervision
- ❖ Farm mechanization
- ❖ Giving incentives.

13 State four reasons which necessitate pruning of tomatoes.

- ❖ To control pests and diseases.
- ❖ To ease penetration of chemical spray.
- ❖ To remove diseased parts
- ❖ To avoid the crop being too bushy.
- ❖ To reduce competition for nutrients.

14 Name two methods of budding.

- ❖ T-budding
- ❖ Top budding
- ❖ Patch budding

15

- ❖ 5:-altitude of 5000ft where the variety can be grown in and do well.
- ❖ 3:-numbers of crossing that have been done on the seeds.

16

$$= \left(\frac{350}{100} \times 3 \right) = 10.5 \text{ kg 1 day}$$

$$\therefore 30 \text{ days} = (30 \times 10.5) = 315 \text{ kg of D.M}$$

17

- ❖ Recover and establish pathogen-free plants.
- ❖ Faster and requires less space compared with cuttings.
- ❖ Enable mass production of propagules.

18(a)

- ❖ A fungus known as colletotrichum lindemuthianum.

(b)

- ❖ Spray weekly during the wet season.
- ❖ Destroy infected crop residues
- ❖ Dress seeds well before planting
- ❖ Use clean seeds
- ❖ Grow resistant varieties e.g. Wairimu, K74 etc.

19

- ❖ Opportunity cost refers to the returns from the best alternative forgone.

20(a)

- ❖ The condition of the land.
- ❖ The depth of cultivation
- ❖ The type of tilth required.

(b)

- ❖ Labour records
- ❖ Production records
- ❖ Marketing records
- ❖ Field operation records
- ❖ Inventory records.

(c)

- ❖ Mulching
- ❖ Irrigation
- ❖ Pruning
- ❖ Shading.

SECTION B: 20 MKS

21.

- ❖ Put the top soil in the hole.
- ❖ Remove the polythene sleeve carefully by tearing.
- ❖ Insert the seedling at the centre of the hole.
- ❖ Firm the soil around the seedling from the bottom upwards.
- ❖ Mulch and water the seedling after firming the soil.

22(a)

- ❖ Nematode.

(b)

- ❖ Inject toxic substances into plant tissue.
- ❖ They feed on plant roots causing root stunting.
- ❖ Cause, wounds leading to secondary infections.

(c.

- ❖ Fungicides
- ❖ Rodenticides
- ❖ Insecticides
- ❖ Nematicides

23(a)

- ❖ Gabion.

(b)

- ❖ Binding wires
- ❖ Wire mesh which are galvanized.
- ❖ Stones
- ❖ Sacks.

(c) Amount and distribution rainfall in the area.

- ❖ Slope of the land /topography.
- ❖ Width of the gully.
- ❖ Volume of water in the gully.

24(a)

- ❖ Oxalis/ oxalis latifolia.

(b)

- ❖ Has underground storage organs bulbs /bulbils.
- ❖ Underground storage organs are not desiccated by sunlight when exposed by cultivation.
- ❖ Has numerous storage organs bulbs/bulbils.
- ❖ Method of propagation favours its regeneration.

(c)

- ❖ Duron
- ❖ Linuron
- ❖ Dalapon.

SECTION C: 40 MARKS

25(a) cabbage production.

- ❖ Ecological requirements
- ❖ Altitude-900-2900m above the sea level.
- ❖ Deep, fertile, well-drained soils
- ❖ Soil PH of 6.5
- ❖ Rainfall of 750-2000mm/annum.
- ❖ Moderate to cool temperatures.

(b)

- ❖ Planting
- ❖ Holes 10cm deep should be dug.
- ❖ Spacing of 90 x 60cm or 60cm x 60 cm depending on the variety
- ❖ Well rotten manure is then added and thoroughly mixed with the soil.

- ❖ Should be firmed at the base.
- ❖ Done in the evening or during a cloudy day.
- ❖ Watering is done.

25c. pest and disease control.

- ❖ Proper seedbed preparation.
- ❖ Using appropriate pesticides
- ❖ Using certified seeds
- ❖ Roguieing
- ❖ Soil fumigation before planting/sterilization
- ❖ Control of weeds/alternate hosts.

(d) Harvesting

- ❖ Mature in 3-4 months after transplating ✓
- ❖ Cut solid ; and compact ✓ heads
- ❖ Use a sharp knife or panga for cutting the ✓ stocks,
- ❖ Leave the outer leaves ✓ intact to mountain freshness of the heads.
- ❖ Upside the cut heads down if the sun is hot.

26a Factors considered in drawing farm planning.

- (i) Government policy /regulations e.g. seed premises for GOK for enterprise
- (ii) Existing market conditions farmer to have a market for the produce in mind.
- (iii) Possible production enterprises-consider the requirement of the various enterprises e.g. climate, price tends.
- (iv) Security-establish those enterprises which require special attention around the home- stead e.g. poultry house calf pen etc.
- (v) Communication and transport facilities.- farming as business requires efficient and reliable means of transport and communication.
- (vi) Farmer's objectives and preference. -the farmer is the main operator so his wishes should be considered for a benefit in psychological effect for their success.
- (vii) Current trends in labour market.

- ❖ Labour availability is a fundamental need for the success of enterprises.
- (viii) Size of the farm
- ❖ Dictates the scale of production e.g. small or large scale farming.
- (viii) Environmental factors.
- ❖ Determine specific locations of enterprise on the farm e.g. topography soil PH etc.
- (ix) Availability of cost of farm inputs.
- ❖ Financial strength/ ability of the farmer are crucial for a type of enterprises to be started.

26 ***(b) Factor inputs***

(I) Fixed proportion- No substitution of input involved i.e. both inputs should be present.

(ii) Constant rate of substitution.

- ❖ Input factors substitute one another at a constant rate for each level of production regardless of the ratios used.

(Iii) Varying rate of substitution

Inputs substitute one another at varying rate e.g. feeding hay and grains to livestock.

27(a) ***physical measures of pest control***

(i) Use of scare crows –can scare away large animals e.g. monkeys and birds.

(ii) Flooding –some pests e.g. army worms get drowned is flooding is done on the field.

(iii) Suffocation –hermetic Cyprus bins which suffocated with carbon (iv) oxide

(iv) Proper drying of produce.-dried grains are difficult to penetrate by pests and discourage built up of moulds.

(v) Use of lethal temperature –extreme temperature control insect pests.

(vi) Use of electro- magnetic radiation.

- ❖ Radio active radiations deactivate enzymes in some insects while others may be attracted then killed.

(vii) Use of physical destruction of pests

- ❖ Some pests can be killed directly in contact by the farmer e.g. mole, rats ect.

(viii) Physical barriers – rat- proofing control rats, fence control large animals.

(b) Aspects of rainfall:

(i) Rainfall reliability

- ❖ Prediction of the start of rain determines the start of land preparation and time of planting.

(ii) Amount of rainfall

- ❖ Different crops require their own specific amount of rainfall during their growing period.

(iii) Rainfall intensity

- ❖ Rainfall of high intensity damages crops and cause soil erosion.

(iv) Rainfall distribution

- ❖ Well distributed rainfall ensures a better growth and performance of the crop.

27c.) Compost manure preparation

Four -heap method

- ❖ Clear the vegetation and top soil /subsoil from the selected site.
- ❖ Level the ground surface.
- ❖ Fix posts at a distance of 1.2.m apart to form the corners of the heap.
- ❖ Fix wood planks on the sides and place the materials at the selected sites.
- ❖ Allow enough time (3 -4wks) for the materials to rot at each site before transferring.
- ❖ Repeat the procedure 3 times until the materials are fully decomposed.
- ❖ When fully decomposed take the materials to the field.

SAMPLE PAPER 9

SECTION A(30 MARKS)

Answer all the questions in this section in the spaces provided.

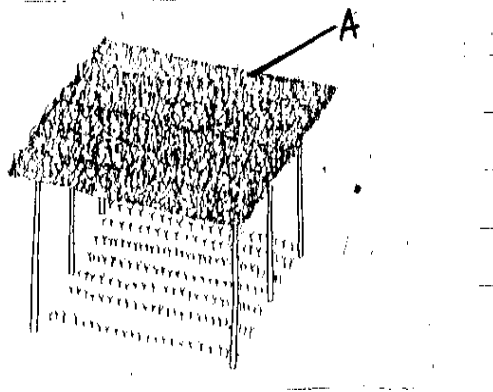
1. **State two** reasons why a farmer should intercrop maize and beans. (2mks)
2. **State two** reasons for processing agricultural produce. (2mks)

3. **Name any three** methods which can be used to detect mineral nutrient deficiency in crops. (1½mks)
4. **State three** methods of training crops. (1½mks)
5. **State three** reasons why rough lemon is preferred as a root stock in the grafting of citrus. (1½mks)
6. **List two** advantages of proper soil aeration in crop growth. (1mk)
7. **State any two** conditions that lead to small scale farming. (1mk)
8. **State three** importance of parent material in the soil profile. (1½mks)
9. **State four** ways in which water pollution can be prevented or controlled. (2mks)
10. **State two** advantages of shifting cultivation (2mks)
11. **Give four** conditions under which shifting cultivation may be practicable. (2mks)
12. **Give four** factors that should be considered when choosing the type of farming system to be Practiced. (2mks)
13. **Give two** ways in which agriculture contributes to the development of industries (2mks)
14. **Give four** apparatus which would be used to perform an experiment to determine the water holding capacity of a soil. (2mks)
15. **State two** benefits of a good soil structure to plants. (2mks)
16. **Define** the term soil capping. (1mk)
17. **State four** characteristics of sub – soil. (2mks)
18. **Give two** ways a farmer would improve the structure of a waterlogged clay soil. (1mk)

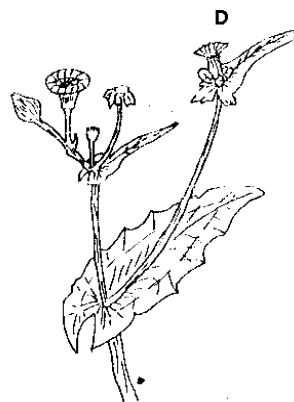
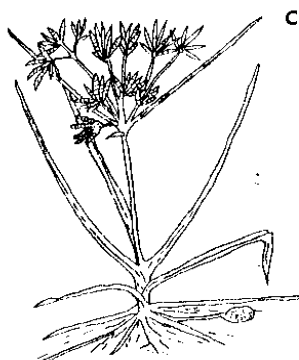
SECTION B (20 marks)

Answer all the questions in this section in the spaces provided.

19. **Given** that onions are planted at a spacing of 30cm x 8cm calculate the plant population in a plot of land measuring 4m x 3m show your working. (1½mks)
20. **The** diagram below shows a structure used in crop production.



- (a) **Identify** the structure above. (½mk)
 - (b) **Give** a reason for carrying out each of the following practices in the structure shown above
 - (i) Pricking out. (1mk)
 - (ii) Hardening off. (1mk)
 - (c) **What four** methods are used in breaking dormancy in seeds meant for planting in the above structure. (2mks)
 - (d) **State three** importance of the part labelled **A** in the above structure. (1½mks)
21. **The** diagrams below shows, weeds.



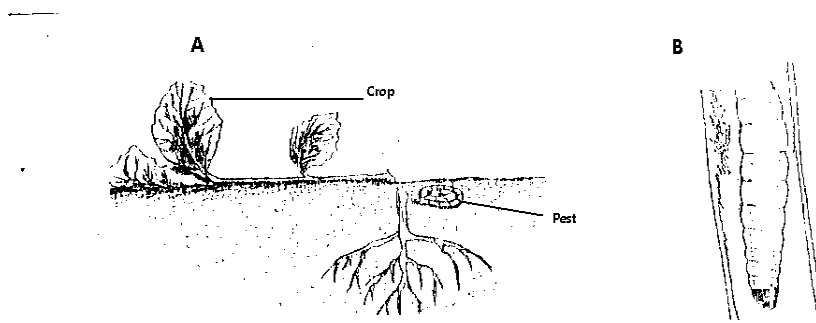
- (a) Identify the weeds **C** and **D**. (1mk)

C

D

- (b) **State** why it is difficult to control weed **C** (1mk)
- (c) **State two** economic importance of weed **D** (1mk)

22. **The diagrams** below **A** and **B** illustrates some field pests study them carefully and answer the questions that follow.



- (a) **Identify** pests **A** and **B**. (1mk)

A

B

- (b) **State two** damages caused by pest **B** to a crop of maize. (1mk)
- (c) **Give two** cultural practices carried out to control the pest in **A**. (1mk)

23. (a) **State four** factors that should be considered when sitting a compost manure heap/ pit. (2mks)

- (b) When preparing compost manure explain the importance of each of the following.
- (i) Addition of ash. (1mk)
- (ii) Regular turning of the compost manure. (1mk)
- (c) **State one** reason why the use of organic manure is not recommended in carrot production. (1mk)

24. (a) **Define** the term micro-catchment's as used in soil and water conservation. (½mk)

- (b) Give two types of micro- catchments. (1mk)

SECTION C (40 marks)

Answer any two questions in this section in the spaces provided at the end of the section.

25. Describe the establishment and management of a grass pasture from land preparation to the time the pasture is ready for grazing. (20mks)
- (i) Land preparation. (6mks)
- (ii) Planting (7mks)
- (iii) Field management practices. (7mks)
26. (a) What is a production function? (1mk)
- (b) A farmer has a piece of land where he has been growing millet his farm records of millet Production for 9 years is as shown below only one input factor is considered i.e.fertiliser application.

| Year | Fertilizer applied in (bags) | Total out put of millet in (bags) |
|------|------------------------------|-----------------------------------|
| 1992 | 0 | 4 |
| 1993 | 2 | 10 |
| 1994 | 4 | 28 |
| 1995 | 6 | 42 |
| 1996 | 8 | 52 |
| 1997 | 10 | 60 |
| 1998 | 12 | 66 |
| 1999 | 14 | 66 |
| 2000 | 16 | 64 |

- (i) Using the above data and an appropriate scale draw a graph to show the relationship between inputs and total output. (5mks)

- (ii) From the graph you have drawn how many bags of millet will the farmer obtain if he applied a 9 bags of fertilizer.
(½mk)
- (iii) **Calculate** the farmers MP (marginal product) for the year 1994.
(1mk)
- (iv) **Calculate** the average product for the year 1996.
(1mk)
- (v) **What** rate of fertilizer application would the farmer choose if he wanted to grow millet in 2001 **Give a reason.** (1mk)
- (c) On 1st June 2007 Bidii farm purchased on credit the following items from valley agro-vet shop.
- 15 bags of sow and weaner meal 100kg each shs 1350 per bag.
 - 20 bags of finisher meal 70kg each shs 800 per bag
 - 14 bag D.S.P fertilizer 50kg each shs 1800 per bag
 - 20 bags of seed maize 10kg each shs 10, 50 per bag
 - 2 milking churns 50 litres each shs 3,500 per can
 - 4 pruning knives (medium sized) shs 400per knife
- (i) **Prepare** the purchase order that bidii farm made tovalley agro-vet shop. (7mks)
- (ii) **Calculate** the value of each item purchased and the total value of the order. (3½mks)
27. (a) **Discuss** the harvesting of cotton under the following sub – headings.
- (i) Stage of harvesting . (3mks)
 - (ii) Method and procedure of harvesting. (4mks)
 - (iii) Precautions in harvesting. (3mks)
- (b) **Explain** how various field practices help to control crop diseases. (10mks)

MARKING SCHEME
SAMPLE PAPER 9
SECTION A 30 MARKS

1.
 - ❖ To enhance nitrogen fixation / soil fertility
 - ❖ To reduce soil erosion/ enhance soil and water conservation.
 - ❖ To improve soil structure
 - ❖ It increases yield per unit area.
 - ❖ If one crop fails the farmer benefits from the other / diversification.
 - ❖ To suppress weeds growth. (2 x 1)

2.
 - ❖ To enhance / increase the keeping quality
 - ❖ Reduce bulkiness
 - ❖ To improve the quality of the produce
 - ❖ To improve market value
 - ❖ To improve its utility. (2 x 1)

3.
 - ❖ Soil analysis / testing
 - ❖ Plant tissue analysis
 - ❖ Observing deficiency symptoms. (½ x 3)

4.
 - ❖ Staking

- ❖ Propping
- ❖ Pruning
- ❖ Trelising (½ x 3)

5.

- ❖ Drought resistant
- ❖ Resistant to soil borne pests and diseases/ greening disease.
- ❖ Adaptable to water logging and salinity
- ❖ Compatible with most scions. (½ x 3)

6.

- ❖ Enhances microbial / micro- organisms activities.
- ❖ Promotes root respiration and development of a good root system.
- ❖ Reduces accumulation of toxic substances in the soil e.g. iron and manganese elements.
- ❖ Facilitates absorption of nutrients and water by crops (½ x 2)

7.

- ❖ Population pressure on land
- ❖ Limited capital for large scale farming
- ❖ Lack of incentives / market
- ❖ Government policy
- ❖ High costs of inputs. (½ x 2)

8.

- ❖ Determines soil texture
- ❖ Determines soil colour
- ❖ Determines type of soil
- ❖ Determines soil mineral composition
- ❖ Determines soil depth. (½ x 3)

9.

- ❖ Take soil conservation measures to minimize loose of soil through erosion.
- ❖ Fencing of water sources to minimize possible pollution by livestock or humans.
- ❖ Vegetate river banks by planting grass to minimize siltation in rivers.
- ❖ Employ storm water control methods and disposal systems especially in areas with heavy rains.
- ❖ Enforcing by – laws on the use of integrated methods of controlling pests and weeds (non – chemical methods / organic farming) (½ x 4)

10.

- ❖ Restores soil structure
- ❖ Reduces chances of pests and disease build – up.
- ❖ Allows land to rest resulting in nutrient build- up
- ❖ Has no capital requirement.
- ❖ No land disputes as land ownership is not individualized. (2 x 1)

11.

- ❖ Where land is abundant.
- ❖ Population is sparse

- ❖ Number of livestock per unit area is low.
- ❖ Where land is communally owned. (½ x 4)

12.

- ❖ Resources available
- ❖ Environmental factors
- ❖ Government policy and regulations
- ❖ Skills and knowledge of the farmers on the enterprise in question.
- ❖ Type of enterprise to adopt.
- ❖ Cultural factors / traditions and taboos / religious beliefs.
- ❖ Aims / objectives of the farmers / enterprise.
- ❖ The size of the farm.
- ❖ Type of soil in the area. (½ x 4)

13.

- ❖ By providing income / capital for starting the industries
- ❖ Provides market for industrial goods / products.
- ❖ Provides raw materials for the industries. (2 x 1)

14.

- ❖ Measuring cylinders
- ❖ Beakers / containers
- ❖ Weighing balance
- ❖ Funnel
- ❖ Stand. (½ x 4)

15.

- ❖ Improves water holding capacity
- ❖ Improves root penetration and proliferation
- ❖ Facilitates proper soil aeration leading to better root development and micro – bial activities. (2x1=2)

16.

- ❖ Is the development or formation of an impervious layer on the soil surface which impedes water infiltration and root penetration? (1 x 1)

17.

- ❖ Poorly aerated
- ❖ Light coloured
- ❖ Rich in leached nutrients
- ❖ Low in organic matter.
- ❖ Contains less micro- organisms. (½ x 4)

18.

- ❖ Application of lime
- ❖ Application of organic manure

- ❖ Avoid over cultivation.
- ❖ Draining excess water.
- ❖ Planting eucalyptus trees
- ❖ Planting grass.

($\frac{1}{2}$ x 2)

SECTION B (20 MARKS)

19.

$$\text{❖ Plant population} = \frac{\text{area of land}}{\text{spacing}} \sqrt{\frac{1}{2}}$$

$$= \frac{400\text{cm} \times 300\text{cm}}{30\text{cm} \times 8\text{cm}} \sqrt{\frac{1}{2}}$$

$$= 500 \text{ onions} \sqrt{\frac{1}{2}} \quad (\frac{1}{2} \times 3)$$

Or: Plant population = $\frac{(400 + 1)}{30\text{cm}} \times \frac{(300\text{cm} + 1)}{8\text{cm}} \sqrt{\frac{1}{2}}$

$$= (14 \times 39) \sqrt{\frac{1}{2}}$$

$$= 546 \text{ plants / onions} \sqrt{\frac{1}{2}} \quad (\frac{1}{2} \times 3)$$

20(a)

- ❖ Nursery bed

($\frac{1}{2}$ x 1)

(b)(i)

- ❖ To avoid overcrowding of the seedlings /allow seedling to grow strong and healthy
- ❖ To transfer seedling from one nursery to another / seed box. (1 x 1)
- ❖ To prepare seedlings to the ecological conditions in the main field/ reduce transplanting shock.

(c)

- ❖ Heat treatment
- ❖ Chemical treatment
- ❖ Soaking in water
- ❖ Scarification
- ❖ Mechanical breaking.

($\frac{1}{2}$ x 4)

(d)

- ❖ To reduce the amount of water loss through vaporization/ evaporation / transpiration.
- ❖ To modify nursery temperature.
- ❖ To reduce the impact of rain drops / hailstones there by minimizing damage on the seedlings.
- ❖ Reduce splash erosion.
- ❖ Reduce the scorching effect the seedlings. (½ x 3)

21(a)

- ❖ C Nut grass (*Cyperus rotundus*)
- ❖ D- sow thistle (*sonchus oleraceus*) (½ x 2)

(b)

- ❖ It has underground storage organs (bulbs) (1 x 1)

(c)

- ❖ Used as animal feed
- ❖ Used as human food (vegetable)
- ❖ It is a source of medicine / medicinal. (½ x 2)

22(a)

- ❖ A- cutworm
- ❖ B- Maize stalk borer. (½ x2)

(b)

- ❖ Burrow tunnels in the stems and growing tips destroying transport system.
- ❖ Eats leaves and reduce photosynthetic surfaces.
- ❖ Bores holes on maize cobs reducing the yields. (½ x 2)

(c)

- ❖ Timely planting
- ❖ Crop rotation
- ❖ Close season
- ❖ Trap cropping
- ❖ Field hygiene. (½ x 2)

23(a)

- ❖ Drainage / topography
- ❖ Direction of prevailing wind
- ❖ Size of the farm / proximity
- ❖ Accessibility. (½ x 4)

(b)(i)

- ❖ To improve the level of phosphorous and potassium in the resulting manure.
- ❖ Buffers soil PH. (1 x 1)

(ii)

- ❖ To ensure even / uniformity in decomposition. (1 x 1)

(c)

- ❖ It encourages/ induces forking in carrots. (1 x 1)

24(a)

- ❖ Are micro- environments which have been designed in such a way that they aim at conserving soil and water around growing crops like bananas and citrus tree crops? (½ x 1)

(b)

- ❖ Negarims
- ❖ Trapizoidal
- ❖ Semi- circular bunds. (½ x 2)

25 SECTION C 40 MARKS)

(i) Land preparation.

- ❖ Clear land and remove the stumps
- ❖ Cultivate and harrow land to fine tilth
- ❖ Prepare land early / during the dry season / before rains.
- ❖ Ensure that land is free from weeds
- ❖ Firm the seed bed using rollers before planting
- ❖ Select desirable variety of seed grass for the ecological zone of the area. (1 x 6)

(ii) Planting

- ❖ Use certified seeds/ healthy seeds
- ❖ Plant / sow the seeds at the onset of rains just before rains / during planting / early planting.
- ❖ Apply phosphatic fertilizer at planting time at appropriate rates.
- ❖ Drill or broadcast the seeds evenly on the seed bed.
- ❖ Use a recommended seed rate for the variety chosen.
- ❖ Bray twigs or gunny bags to cover the seeds.
- ❖ Lightly with soil or plant 3-5 times the diameter of seeds.
- ❖ Firm the seed using rollers after sowing / planting seeds.

(iii) field management practices

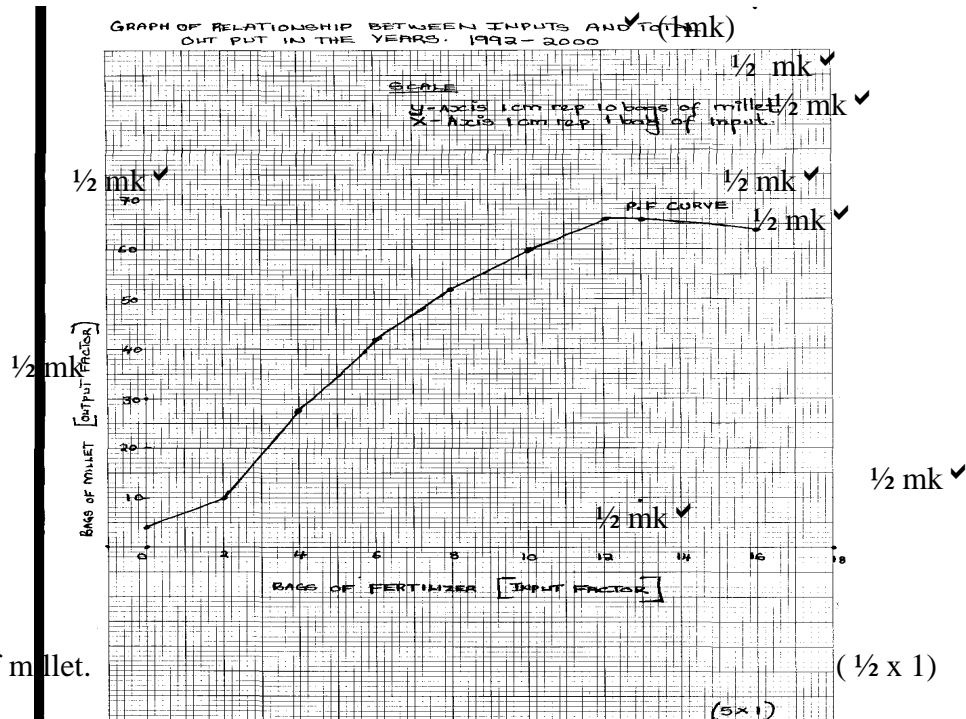
- ❖ Control weeds by uprooting or applying appropriate herbicides.
- ❖ Apply nitrogenous fertilizers about 6 weeks after germination in split application.
- ❖ carry out reseeding
- ❖ Avoid grazing when pasture is too young.
- ❖ Irrigate in dry season.

- ❖ Cut back / practice light grazing in the initial phase of establishment to encourage lateral growth.
- ❖ To control pests e.g. moles.
- ❖ Use the correct stocking rate to avoid overgrazing. (1 x 7)

26(a)

- ❖ Is the physical relationship between inputs and output which shows the quantity of output that may be expected from a given combination of inputs.

(1x 1)



(ii) 56 bags of millet.

(iii)

| year | input | Total output | Marginal output |
|-------|-------|--------------|-----------------|
| 1992 | 0 | 4 | - |
| 1993 | 2 | 10 | 6 |
| 1994 | 4 | 28 | 18 |
| 1995 | 6 | 42 | 14 |
| 1996 | 8 | 52 | 10 |
| 1997 | 10 | 60 | 8 |
| 1998 | 12 | 66 | 6 |
| 1999 | 14 | 66 | 0 |
| 2 000 | 16 | 64 | -2 |

Farmers marginal output for the year 1994= 18

(1 x1)

(iv) Average product for the year 1996

= total output

Number of input units

= 52 bags _____ =13

(1 x 1)

- 4 units of inputs
 (iv) 12 ± bag
 -because it is the point where the law of diminishing returns begins to operate(OWTTE)
 (½x2)

(c)(i) PURCHASE ORDER ✓
 NUMBER ✓

BIDII FARM ✓

DATE ✓

TO VALLEY AGRO- VET SHOP ✓

Please supply the following ✓

| Item no | description | unit | quantity |
|---------|---------------------|-------------|------------|
| 1 | Sow and weaner meal | 100kg | 15 bags ✓ |
| 2 | Finisher meal | 70kg | 20 bags ✓ |
| 3 | d.s.p fertilizer | 50kg | 14 bags ✓ |
| 4 | seed maize | 10kg | 20 bags ✓ |
| 5 | milking churn | 50 litres | 2 cans ✓ |
| 6 | pruning knives | medium size | 4 knives ✓ |

Ordered by signature ✓

Authorized by signature ✓ (½ x 14)

| No | item | units | a | shs | cts |
|----|---------------------|-------|------|--------|------|
| 1 | Sow and weaner meal | 15 | 1350 | 20,250 | 00 ✓ |
| 2 | Finisher meal | 20 | 800 | 16,000 | 00 ✓ |
| 3 | d.s.p | 14 | 1800 | 25,200 | 00 ✓ |
| 4 | seed maize | 20 | 1050 | 21,000 | 00 ✓ |
| 5 | milking churn | 2 | 3500 | 7,000 | 00 ✓ |
| 6 | pruning knives | 4 | 400 | 1,600 | 00 ✓ |
| | total | | | 91,050 | 00 ✓ |

(½x7)

27(a)(i) stage of harvesting

- ❖ 4 – 4 ½ months after planting when balls open.
- ❖ Start picking as soon as the 1st balls open.
- ❖ Do it on weekly intervals to prevent discolouration of lint. (3 x 1)

(ii) Method and procedure of harvesting

- ❖ Picking is done manually.
- ❖ The seed cotton is sorted into two grades AR- first grade free from insect damage and foreign matter and be clean white. BR- may not have all these qualities.
- ❖ The picker carries two containers while harvesting one for grade AR and the other for BR.
- ❖ The seed cotton is sorted into two grades AR (Safi) BR (Fifi) (4x1)

(iii) Precautions in harvesting.

- ❖ Ensure no foreign matter such as leaves and twigs are mixed with seed cotton.
- ❖ Avoid picking when cotton is wet.
- ❖ Avoid handling harvested cotton using sisal bags since their fibres may mix with the seed cotton creating problems during ginning. (3 x1)

(b)

- ❖ Crop rotation –breaks life cycles of pathogen.
- ❖ Rogueing – checks disease spread.
- ❖ Planting certified/ clean seeds-prevents introduction of pathogens into the field.
- ❖ Early planting / timely planting – crops establish faster before the outbreak of diseases.
- ❖ Proper spacing – creates unfavorable micro-climate for some pathogens.
- ❖ Weed control – removes alternate hosts of some pathogens.
- ❖ Use of clean tools and equipments – reduces chances of contaminating crops with pathogens.
- ❖ Pruning – removes diseased plant parts and creates unfavourable micro –climate.
- ❖ Quarantine – prevents spread of pathogens.
- ❖ Heat treatment – kills pathogens.
- ❖ Destruction of crop residue –kills pathogens and destroys breeding grounds.
- ❖ Pest control – reduces disease vector.
- ❖ Proper fertilizer / manure application- controls deficiency diseases.
- ❖ Close season- breaks life cycles of pathogens (stating ½ mark explanation ½ mark)
(½ x 20)

SAMPLE PAPER 10

SECTION A (30marks)

Answer ALL the questions in the section in the spaces provided.

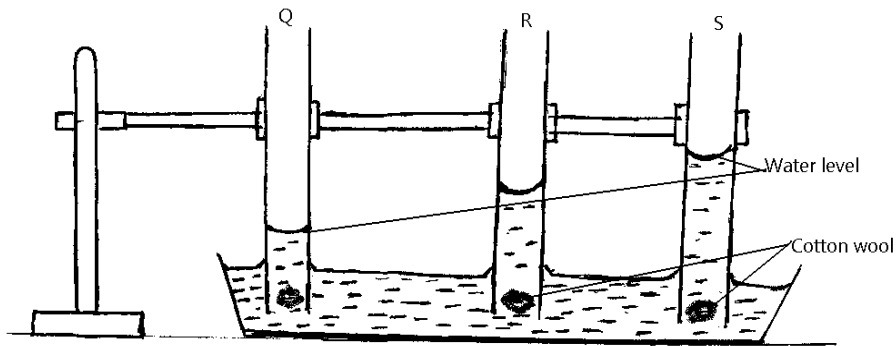
1. **Give four** advantages of mixed farming. (2mks)
2. **Name two** agriculture organizations for the youth. (1mk)
3. **State four** objectives of land reforms in Kenya. (2mks)
4. **Give three** aspects of light that are important in growth of crops. (1½mks)
5. **State four** sources of agricultural credit. (2mks)
6. **Name six** types of erosion on the basis of the agent. (3mks)
7. **Define** the following terms. (1mk)
 - (i) Local purchase order.
 - (ii) Opportunity cost
8. **State three** deficiency symptoms of potassium in the growth of crops. (1½mks)
9. **State three** cultural practices that a farmer may use to control maize streak disease in maize. (1½mks)
10. **Give two** disadvantages of minimum tillage. (1mk)
11. **State five** benefits of agro forestry trees on terraces. (2½mks)
12. **Give four** types of records that can be kept by a crop farmer. (2mks)

Give four factors that influence the quality of hay. (2mks)
13. **Mention three** importance of tissue culture in crop production. (1½mks)
14. **Give two** precautions that should be observed when harvesting cotton. (1mk)
15. **Give five** functions of a farm Manager. (2½mks)
16. **State three** factors influencing the effectiveness of pesticides. (1½mks)
17. **Give three** reasons for pruning tea. (1½mks)

SECTION B (20MARKS)

Answer all questions in this section in the spaces provided.

19. The diagram below shows an experiment set up using soil type QRS and observations made after 24 hours. **Study** the diagram below and answer the questions that follow.



- (a) The experiment set up above is designed to study what? (1mk)
- (b) **Name** the three soil types QRS. (3mks)
- Q
- R
- S
- (c) What are the characteristic texture of soil type R and S?
- R (1mk)
- S (1mk)
20. A farmer can combine dairy meal and home made ration in order to produce 50kg of milk from a lactating cow as shown in the table below.

| Dairy meal (kgs) | Home –made ration (kg) | Marginal rate of substitutions |
|------------------|------------------------|--------------------------------|
| 1 | 45 | O |
| 2 | 36 | J |
| 3 | 29 | 7 |
| 4 | 24 | K |
| 5 | 20 | 4 |
| 6 | 18 | L |
| 7 | 17 | I |
| 8 | 16 | M |

- (a) Given the above information **calculate** the marginal rate of substitution and gives the values of **J, K, L, and M.** (½mk)
- J

K (½mk)

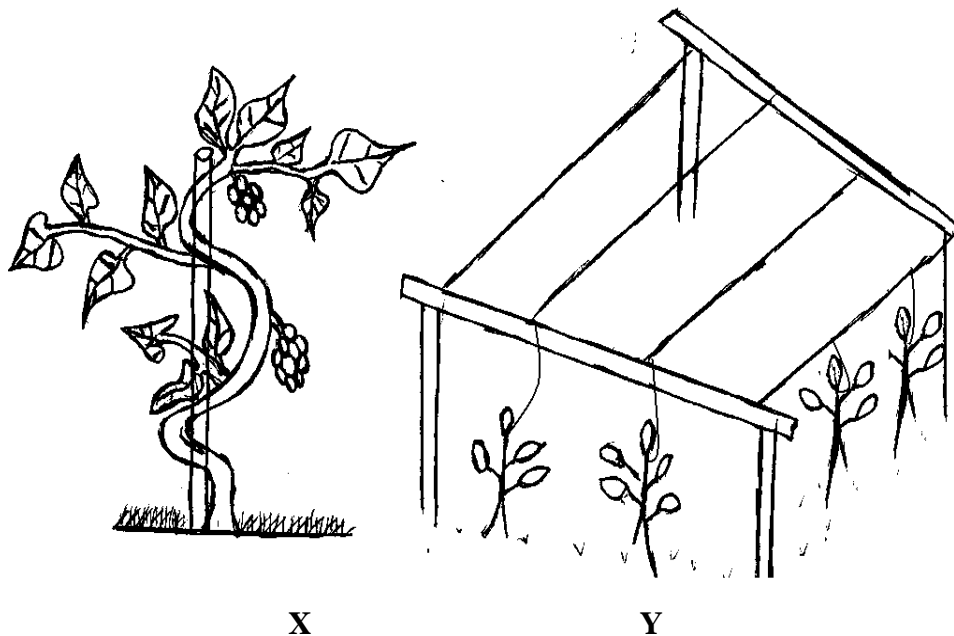
L (½mk)

M (½mk)

(b) Give n that the price of dairy meal is Ksh 10 per kilograms and that of home –made ration is Ksh. 4 per kilograms, **calculate** the least cost combination. (1mk)

(c) **State** the level of inputs that the farmer should use to produce 50kgs of milk from the cow. (1mk)

21. The diagram below represents some crop management practices. Study them and answer the questions that follow.



(a) **State** the general practice represented by the two illustrations. (1mk)

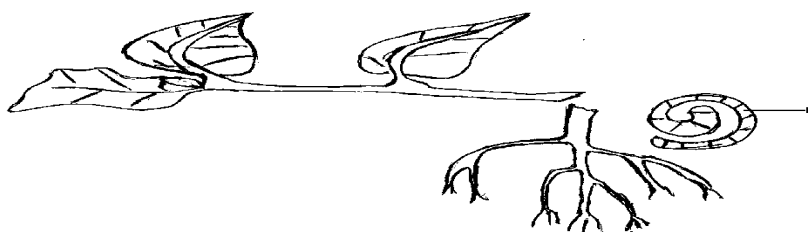
(b) **Identify** the methods represented by **X** and **Y**. (2mks)

X

Y

(c) **Give two** reasons for carrying out the process represented by **X**. (2mks)

22. **Study** the diagram below and answer the questions that follow.



- (a) **Identify** the pest H. (1mk)
- (b) At what stage of development is this pest destructive to crop. (1mk)
- (c) **State one** symptom of attack of this pest. (1mk)
- (d) **Give two** methods that can be used to control the above pest. (2mks)

SECTION C (40 MARKS)

Answer any two questions in this section in the spaces provided after question. 25

23. **Discuss** the management practices in the production of maize for grains from planting to harvesting. (20mks)

24. (a) **What** is a profit and loss account. (1mk)

Use the information below to prepare a profit and loss account for Mugunda’s enterprise for the year ended 31st December 2006 the farm manager bought the following items at the price indicated. (15mks)

| Item | Kshs. |
|---------------------|--------------|
| Maize seeds | 10, 0 00.00 |
| DAP fertilizer | 25, 000.00 |
| Tractor disc plough | 50,000.00 |
| Diesel fuel | 12,000.00 |
| Dairy meal | 20,000.00 |
| Milk can | 2,500.00 |
| Knapsack sprayer | 6,500.00 |

| | |
|------------|-----------|
| Vet drugs | 5000.00 |
| Herbicides | 18,000.00 |

During the year the farm manager sold the follow items.

| Item | Kshs. |
|---------------|---------|
| Maize to NCPB | 210,000 |
| Milk sales | 500,000 |
| Weaners | 35,000 |

The following information is also indicated in the farm managers' book of accounts.

| Item | ksh. |
|---------------------------|------------|
| Opening valuation | 300,000.00 |
| Closing valuation | 600,000.00 |
| Debts receivable for | |
| Tractor service fees | 28,000.00 |
| Depreciation on machinery | 7,500.00 |

- (b) Did the farm make a profit or loss? (1mk)
- (c) How much profit /loss was made by the farm? (1mk)
- (d) **Calculate** the percentage profit or loss made by the farm. (2mks)

25 (a) **Explain** the factors considered in spacing of crops in the field. (12mks)

(b) **Briefly explain** the practices carried out on seeds/seedlings to prepare them for planting. (4mks)

(c) **Describe** practices that a farmer should carry out to ensure uniform germination of seeds. (4mks)

MARKING SCHEME SAMPLE PAPER 10

SECTION A (30MARKS)

1.
 - ❖ Crops and livestock sustain each other/manure is used to improve soil fertility and crop residues are used to feed livestock.
 - ❖ Diversification/ avoidance of total loss incase of damage of one enterprise by either pests or diseases.
 - ❖ Farmer gets a more balanced diet from both crop and livestock products.
 - ❖ Maximize use of labour at farm level. 4 x ½ = 2mks)
2.
 - ❖ Young farmers club of Kenya. (YFCK)
 - ❖ 4 K clubs. 2 x ½ = 1mk
3.
 - ❖ Increase agricultural production through proper land use.
 - ❖ Enhance efficient land use
 - ❖ Put idle land into use
 - ❖ Settle the landless easing population pressure in some areas.
 - ❖ Enhance commercial instead of subsistence production.
 - ❖ Encourage conservation and improvement of land and its resources. 4 x ½ = 2mks
4.
 - ❖ Light intensity
 - ❖ Light duration
 - ❖ Light wavelength. 3 x ½ = 1 ½ mk
5.
 - ❖ Crop boards (e.g. KTDA, heat board etc)
 - ❖ Cooperative society's communal banks.
 - ❖ Commercial banks.
 - ❖ Agriculture financial cooperation.(AFC)
 - ❖ Settlement fund trustee.
 - ❖ Personal savings
 - ❖ Gifts /donations. 4 x ½ = 2mks
6.
 - ❖ Raindrop / splash erosion.
 - ❖ Sheet erosion
 - ❖ Rill erosion

- ❖ Gully erosion
- ❖ River bank /stream / channel erosion
- ❖ Wind erosion
- ❖ Solifluction.

6 x ½ = 3mks

7.

- ❖ Purchase order this is a request to a trader or business firm to supply goods on credit. 1 x ½
- ❖ Opportunity cost: this is the monetary value of the next best alternative foregone. 1 x ½ = ½

8.

- ❖ Leaf curl
- ❖ Chlorotic leaves/yellowing of leaves.
- ❖ Premature leaf fall.
- ❖ Scorching of leaves at the tips and along the outside while the inside remain green.

3 x ½ = 1½ mk.

9.

- ❖ Use of resistant varieties
- ❖ Early planting.
- ❖ Rogueing
- ❖ Use of certified seeds
- ❖ Crop rotation
- ❖ Field hygiene
- ❖ Close season.

3 x ½ = 1 ½ mks

10.

- ❖ Leads to incomplete decomposition of organic matter.
- ❖ No thorough weed control especially rhizomatous weeds.
- ❖ Encourage soil compaction thus poor structure.

2 x 1 = 2mks

11.

- ❖ Tree roots stabilize the soil
- ❖ Help to conserve soil and water.
- ❖ Modify the micro-climate
- ❖ After decomposition of leaves nutrients are added to the soil/ improve soil/improve soil fertility.
- ❖ After decomposition organic matter improves soil structure.
- ❖ Trees shelter crops from wind damage.
- ❖ Diversify products from terraces by including fruits and fodder.

5 x ½ = 2 ½ mks)

12.

- ❖ Field operation records
- ❖ Labour records
- ❖ Production record/ yield records.
- ❖ Account record.

4 x ½ = 2mks

13.

- ❖ Type/ species of crop used.
- ❖ Degree of damage during handling
- ❖ Speed of drying / making the hay
- ❖ Stage of growth at which the forage was cut.
- ❖ Presence of forage material in the hay.
- ❖ Method of storage.

14.

- ❖ Mass production of propagates.
- ❖ Help in control of viral diseases
- ❖ Requires less space.
- ❖ It's a fast method of propagation.

3 x ½ = ½ mk

15.

- ❖ Harvest during the dry weather.
- ❖ Separate grade A and B when harvesting.
- ❖ Avoid using gunny bags.

2 x ½ = 1mk

16.

- ❖ Acquiring information/ knowledge relevant to farm business.
- ❖ Analyzing the information / knowledge
- ❖ Formulation of a farm plan
- ❖ Bearing the risks/taking responsibility.
- ❖ Implementing the farm plan.

5 x ½ = 2 ½ mks

17.

- ❖ Plant morphology and anatomy.
- ❖ Stage of plant growth
- ❖ Mode of action
- ❖ Environmental factors
- ❖ Concentration of herbicide.
- ❖ Formulation of herbicide.
- ❖ Method of application.

3 x ½ = 1 ½ mks

18.

- ❖ Increase the yield.
- ❖ Achieve a uniform plucking table.
- ❖ To reduce what is generally a tall tree to a low spread bush.
- ❖ To facilitate harvesting.

3 x ½ = 1 ½ mks

SECTION B

19.(a) Soil water capillarity.

1 x 1 = 1mk

(b)

- Q sandy soil
- R loam soil
- S clay soil

(1mk)

(1mk)

(1mk)

(c)

- R coarse textured

(1mk)

S

fine textured

(1mk)

20(a)

J =9

½ mk

K =5

½ mk

L =2

½ mk

M =1

½ mk

(b) LCC = KSH 130

(1mk)

(c) 5kgs of dairy meal and 20kgs of home made ration. (1mk)

21(a) training (1mk)

(b) X staking (1mk)

Y trellis (1mk)

(c)

❖ Supporting the plant/help the plant to bear weight of fruits.

❖ Control soil borne pests and diseases.

❖ Ensure high quality fruits

❖ Allow light penetration to maximize on photosynthesis. 2 x 1 = 2mks

22(a) cut worm (1mk)

(b) Larval stage (1mk)

(c) The stem of the seedling is cut at the level of the ground/ soil. (1mk)

(d) Sprinkling an appropriate insecticide powder at the base of each seedling during planting.

(e) Where seeding has been cut dig out the cutworm and kill it physically. 2 x 1 = 2mks

23.

❖ Clear the land.

❖ Prepare land during dry season.

❖ Thoroughly control perennial weeds

❖ Carry out primary land preparation

❖ Carry out secondary cultivation /harrow the land.

❖ Obtain a medium tilth.

❖ Select seeds that are suitable for the ecological zone.

❖ Long term hybrid varieties / high altitude / 611, 614, 626, 627 are medium term hybrids/medium altitude /511, 512, 513, 514, 515, 516, composite:

-Katumani hybrid, Makueni hybrid , Pwani hybrid - low rainfall areas

❖ Plant at the onset of rainfall of rains /just before the rains start.

❖ Dig holes

❖ Depth of holes 8 – 10cm deep.

❖ Spacing 90cm x 30cm. (2 seed per hole)

❖ 75cm x 25 cm (1 seed per hole)

❖ apply a handful of farm yard manure per hole

❖ apply 10gm of DSI per hole

❖ Mix fertilizer and manure with the soil.

❖ Apply an appropriate pesticide during planting.

❖ Gap immediately after germination

❖ Control weeds through cultivation mulching or by use of appropriate herbicide.

❖ Top dress using nitrogenous first at knee high 145cm height.

❖ Control pest by applying correct patricide.

❖ Harvest when dry

❖ Cut stacks and stool

❖ Dehusk and thresh.

❖ Dry to 12% moisture content and store. 20 x 1 = 20mks

24. PROFIT AND LOSS ACCOUNT FOR MUGUNDA, S FARM AS AT 31/12/2006.

| EXPENSES AND PURCHASES | Ksh | cts | SALES AND RECEIPTS | Ksh | cts |
|------------------------|------------------|-----|--------------------|------------------|-----|
| Opening valuation | 300,000 | 00 | Sale of milk | 500,000 | 00 |
| Purchase of maize | 10,000 | 00 | | | |
| D.A.P Bert | 25,000 | 00 | Wearers | 35,000 | 00 |
| Tractor diesel | 50,000 | 00 | | | |
| Diese fuel | 12,000 | 00 | Debt receivable | 28,000 | 00 |
| Dairy meal | 20,000 | 00 | | | |
| Milk cans | 2,500 | 00 | Closing value | 600,000 | 00 |
| Knap sack sprayer | 6,500 | 00 | | | |
| Vet drugs | 5,000 | 00 | | | |
| Herbicide | 18,000 | 00 | | | |
| Interest payable | 3,000 | 00 | | | |
| Machinery degree | 7,500 | 00 | | | |
| Total | <u>459,000</u> | 00 | | | |
| Profit | <u>913,000</u> | 00 | | 1,373,000 | 00 |
| | <u>1,373,000</u> | 00 | | <u>1,373,000</u> | 00 |

Financial statement showing whether the business has made a profit or loss. During the Accounting period. 1 x 1 = 1mk

- ❖ Statement of profit and loss account ✓
- ❖ Column of purchase and expenses ✓
- ❖ Column of sale and receipts ✓
- ❖ Profit entry on the correct side ✓
- ❖ Correct figure profit ✓
- ❖ Balancing totals ✓
- ❖ Each correct entry
- ❖ Column for sh and cts.

(b) Made a profit ✓ Total (15mks) (1mk)

(c) Made profit of 913,500 ✓ (1mk)

(d) % age = $\frac{\text{profit}}{\text{Opening valuation}} \times 100$
 $= \frac{913500}{300,00} \times 100$
 $= 304.5\%$

Method ✓ (1mk)

Answer ✓ (1mk)

25(a) height-shorter crops require narrower spacing

- ❖ Plant tiller –produces suckers will end to occupy a big space thus wider spacing
- ❖ Soil fertility fertile soil support narrows spacing than infertile soil.
- ❖ Purpose of the crop-maize for silage preparation is spaced narrowly than maize for grains.
- ❖ Soil moisture- dry areas require wider spacing than wet areas.
- ❖ Spreading habits –crops that spread are spaced at wider spacing than crops that do not spread.
- ❖ Number of seeds /hole- if more seeds are planted wider spacing is required.
- ❖ Mechanization –subsequent mechanical operations require crops wider spacing.
- ❖ Pure stand- requires narrower spacing that inserts cropped crops.
- ❖ Disease/ pest control – proper spacing minimizes the spread of pests and diseases.

12 x 1 = 12mks)

(b)

- ❖ Seed inoculation.
- ❖ Seed dressing
- ❖ Seed cleaning
- ❖ Breaking seed dormancy
- ❖ Seed chitting.

4 x 1 = 4mks

(c)

- ❖ Select seeds of the same size age and variety
- ❖ Select seeds free from diseases
- ❖ Plant seeds at same time
- ❖ Prepare seeds for the required uniform tith
- ❖ Plant at the right moisture.
- ❖ Treat seeds against soil borne pests and disease.
- ❖ Treat seed before planting

4 x 1 = 4mks)