

## SECTION A (30 marks)

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

1. State two ways in which the foreign exchange earned from agriculture is important to Kenya. (1 mark)

- Used to service foreign debts  
 - To finance imports eg. drugs, fertilizers, machines  
 - To finance government projects eg. schools, hospitals, roads etc

2. State four effects of excessive nitrogenous fertiliser application on tomatoes. (2 marks)

- Prolonged maturity  
 - Cracking of fruits before maturity  
 - Blossom end rot  
 - Too much vegetative growth

3. State four ways in which burning during clearing of land reduces soil fertility. (2 marks)

- Leads to loss of soil moisture  
 - Destroys soil organisms  
 - Destroys soil organic matter  
 - Exposes soil to agents of soil erosion  
 - Volatilizes soil mineral compounds  
 - Accumulates ash which alters soil pH and mineral availability.

4pts = 2 marks.

4. State four ways in which water pollution caused by farming activities can be controlled. (2 marks)

- controlling soil erosion (Accept any method of controlling soil erosion)  
 - Fencing water sources (Avoid animals drinking directly from the water source)  
 - Controlled use of agricultural chemicals / use of integrated methods  
 - Safe disposal of effluents from farms + controlling risks & weeds  
 - Establishment of vegetation along river banks.  
 - Use of non-chemical methods / organic farming.



5. What is meant by the term preference and choice as used in agricultural economics? (2 marks)

Production resources are limited while production needs are many/unlimited with many competing enterprises. Therefore, a farmer has to <sup>select</sup> ~~make a choice~~ on which enterprise(s) amongst many to use the limited resources (Man as a whole).

6. State four disadvantages of shifting cultivation. (2 marks)

- The total field per unit area is low
- A lot of time <sup>and labour</sup> wasted when farmer is shifting and building new structures
- Farmers have no incentive to develop land and conserve water & soil
- Not applicable in areas of high population density or where there is high population increase
- Should be practiced where land is abundant / adequate / communally owned
- It leads to land fragmentation

7. Name four categories of nursery beds. (2 marks)

- Sunken nursery
- Raised nursery
- Vegetable crop nursery
- Tree nursery
- Vegetative Propagation nursery
- Bare root nursery / Direct / Swaziland nursery
- Containerized nurseries

8. (a) What is meant by the term conveyance of water? (1 mark)

The process of moving water from the point of storage or source to where it will be used or stored.

- (b) State two ways of conveying water. (1 mark)

- Piping
- Use of canals
- Use of containers

9. (a) What is meant by the term land tenure reform? (1 mark)

It's any organized action designed to improve land use and ownership [accept specific types of reform e.g. registration, adjudication, consolidation]



(b) State four advantages of land registration.

(2 marks)

- can be used to secure credit facilities
- Ensures security of tenure / Reduces land grabbing
- Encourages investment in long term / Permanent projects
- Owners of land can lease <sup>sell</sup> all or part of land together
- Reduces land disputes.

10. Name four types of landslides.

(2 marks)

- Slump / slip
- Debris slides
- Rock fall
- Rock slides
- Debris fall

11. State four advantages of small scale farming in Kenya.

(2 marks)

- High production per unit area
- use of improved technology
- Diversification / mixed farming
- Low capital investment
- Surplus produce can be sold for an income
- Enhances food security at household and national level

12. State four disadvantages of stall feeding.

(2 marks)

- High initial capital is required
- Requires high skilled labour
- More labour intensive
- Diseases can easily spread

13. Give four reasons why livestock farmers prepare silage.

(2 marks)

- To distribute available forage throughout the year
- To maximise the utilization of available land
- To provide feed for the dry season
- Excess forage can be sold.



(2 marks)

14. State **four** reasons for carrying out minimum tillage.

- Maintains soil structure
- Conserves soil moisture
- Reduces land preparation costs
- Maintains soil cover/reduces exposure to agents of soil erosion
- Reduces disturbance of roots
- Reduce exposure of humus

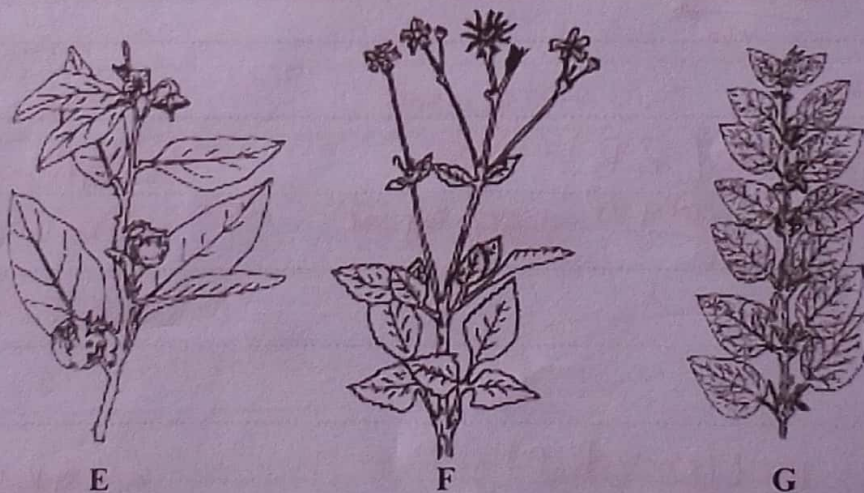
(2 marks)

15. Name **four** financial documents used in farm accounting.

- Invoice
- Receipts
- Delivery note
- Purchase order.
- Statement of account

**SECTION B (20 marks)**Answer **all** the questions in this section in the spaces provided.

16. The diagrams below show certain weeds.



(a) Identify the weeds labelled F and G.

- F Black jack (*Bidens pilosa*) (1 mark)
- G Stinging nettle (*Urtica massaiensis*) (1 mark)



- (b) State **one** way in which each of the weeds labelled E and F affects the quality of livestock products. (1 mark)

E - Poisonous to Livestock

F - Contaminates wool and fur

(1 mark)

- (c) State the **main** way in which the weed labelled G interferes with farm operations. (1 mark)

it irritates farm workers

17. (a) An agronomist recommends application of 120kg N, 60kg  $P_2O_5$  and 80kg  $K_2O$  after testing a soil sample. Calculate the amount of urea (46%N), single super phosphate (20%  $P_2O_5$ ) and potassium oxide (50%  $K_2O$ ) that should be applied on the land.

(4 marks)

i) Urea (46% N)

$$\frac{120 \times 100 \text{ kg Urea}}{46} = 260.87 \text{ kg Urea}$$

$$\begin{aligned} 46 \text{ kg N} &\text{--- from 100 kg Urea} \\ \text{so } 120 \text{ kg N} &\rightarrow \frac{100 \times 120}{46} \\ &= 260.87 \text{ kg} \end{aligned}$$

ii) SSP (20%  $P_2O_5$ )

$$\frac{60 \times 100 \text{ kg SSP}}{20} = 300 \text{ kg SSP}$$

$$\begin{aligned} 20 \text{ kg } P_2O_5 &\text{--- from 100 kg SSP} \\ 60 \text{ kg } P_2O_5 &\rightarrow \frac{100 \times 60}{20} = 300 \text{ kg SSP} \end{aligned}$$

iii) KCl (50%  $K_2O$ )

$$\frac{80 \times 100 \text{ kg KCl}}{50} = 160 \text{ kg KCl}$$

$$\begin{aligned} 50 \text{ kg } K_2O &\text{--- from 100 kg KCl} \\ \text{so } 80 \text{ kg } K_2O &\rightarrow \frac{100 \times 80}{50} \\ &= 160 \text{ kg KCl} \end{aligned}$$

Plus 1 mark for proper calculation / Proper interpretation (Marked once)



(b) Distinguish between fertiliser ratio and fertiliser grade.

(1 mark)

Fertilizer ratio refers to the proportion of the three primary macronutrients in a fertilizer, eg. N.P.K. (10:10:10)  
Fertilizer grade indicates the amount of each nutrient contained in a fertilizer eg. urea (46%N)

18. A farmer has a piece of land 200m long and 36m wide. If the farmer plants beans at a spacing of 30 cm  $\times$  15 cm, calculate the plant population on the piece of land. Show your working.

(5 marks)

Area of land  
spacing

$$= 36 \times 200 \text{ m}^2$$

$$0.3 \text{ m} \times 0.15 \text{ m}$$

$$= \frac{7200}{0.045}$$

$$= 160,000 \text{ Plants}$$

(D) Plant Population

$$= \frac{\text{Area of land}}{\text{Spacing}}$$

$$\text{Area of land} = 20000 \times 36000$$

$$= 720000000 \text{ cm}^2$$

$$\text{Spacing} = 30 \text{ cm} \times 15 \text{ cm}$$

$$\text{Area occupied by one plant} = 30 \times 15$$

$$= 450 \text{ cm}^2$$

$$\therefore \text{Plant Population} = \frac{720000000 \text{ cm}^2}{450 \text{ cm}^2}$$

$$= \frac{720000000}{450} = 160,000 \text{ plants}$$

(A) Area of land  
spacing

$$= \frac{36 \text{ m} \times 200 \text{ m}}{30 \text{ cm} \times 15 \text{ cm}}$$

$$= \frac{(36 \times 200) \text{ m}^2}{(0.3 \times 0.15) \text{ m}^2}$$

$$= \frac{7200}{0.045}$$

$$= 160,000 \text{ plants}$$

(B)

Area of land  
spacing

$$= \frac{36 \text{ m} \times 200 \text{ m}}{30 \text{ cm} \times 15 \text{ cm}}$$

$$= \frac{(3600 \times 20000) \text{ cm}^2}{(30 \times 15) \text{ cm}^2}$$

$$= \frac{720000000}{450}$$

$$= 160,000 \text{ plants}$$

(C)

Area of land  
spacing

$$\text{Area of land} = 200 \text{ m} \times 36 \text{ m} = 7200 \text{ m}^2$$

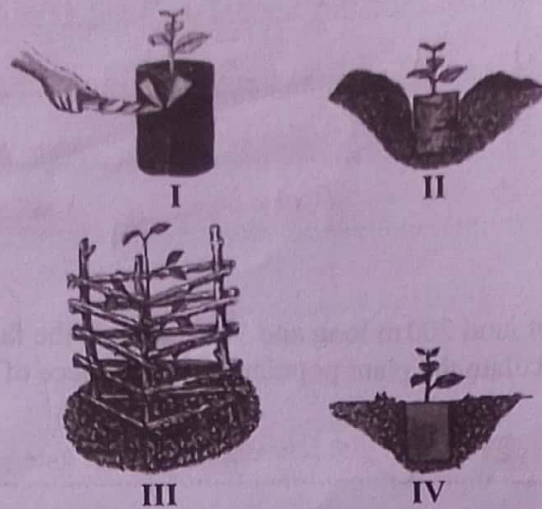
$$\text{Spacing} = 0.3 \times 0.15 \text{ m}^2$$

$$\text{Area occupied by one plant} = (0.3 \times 0.15) \text{ m}^2 = 0.045 \text{ m}^2$$

$$\text{Plant Population} = \frac{7200}{0.045} = 160,000 \text{ plants}$$



19. The diagram below shows a practice in agroforestry.



- (a) Identify the practice. (1 mark)

tree seedling transplanting / tree planting (Transplanting)

- (b) State the importance of the activity labelled:

I To allow the growth of roots in the planted hole.

(1 mark)

IV To plant the seedling at the same depth it was in the sleeve.

(1 mark)

- (c) Why was the soil separated as shown in the activity labelled II? (1 mark)

To facilitate mixing of top soil with manure for filling the planted hole.

- (d) State the **main** precaution observed when covering the seedling as illustrated in III. (1 mark)

- Should allow light penetration  
- Materials which used should be strong enough  
- Should provide enough space for growth.  
- Rails should not allow animal penetration



### SECTION C (40 marks)

20(a)	<p>Medical facilities</p> <p>Housing</p> <p>Security</p> <p>Rewarding good workers</p> <p>Better remuneration</p> <p>Transport provision</p> <p>Protective clothing/uniform</p> <p>Bonus</p> <p>Safe working environment</p>	<p>x) Mechanization/provide good working tools</p> <p>xi) Provide recreational facilities.</p> <p>xii) Provide social amenities eg schools children.</p>	7 x 1	(7 marks)
(b)	<p>Blossom end...</p> <p>(i) Blossom end appears rotten; water soaked; dry;</p> <p>(ii) Too much nitrogen in early growth stages</p> <p>Irregular or infrequent watering</p> <p>Calcium deficiency</p> <p>(iii) -Regular watering</p> <p>Top dressing the crop with the right amount of nitrogen</p> <p>Application of calcium compound fertilizers in the soil</p>	<p>(ii)</p> <p>(iii)</p>	<p>1 x 1</p> <p>3 x 1</p> <p>3 x 1</p>	<p>(1 mark)</p> <p>(3 marks)</p> <p>(3 marks)</p>
(c)	<p><del>(i) Threshing: Removal of beans from pods to facilitate cleaning and storage.</del> by beating with sticks</p> <p><del>(ii) Drying: Beans are dried to attain correct moisture content for storage to prevent rotting.</del> the sun to dry</p> <p><del>(iii) Cleaning: To remove foreign materials before storage.</del> by winnowing</p> <p><del>(iv) Sorting and grading: Sorted and graded according to the quality.</del> Bean plants spread on mats in the sun to dry</p> <p><del>(v) Dusting: Applying chemical powders on seeds to prevent attack by storage pests.</del> Beans are sorted &amp; separated from the bad</p> <p><del>(vi) Packing: Beans are placed into containers for storage.</del> Beans are classified according to size or quality</p>		6 x 1	(6 marks)
21. (a)	<p>i) Slow growth rate of crops as the process of photosynthesis is slowed.</p> <p>ii) High incidence of disease infection to crops, e.g. CBD, hot and cold disease of coffee; Ergon die back</p> <p>iii) Quality of crops, e.g. tea and pyrethrum is improved</p>	<p>Low incidence of disease infection</p> <p>Quality of crops is affected</p>	2 x 1	(2 marks)

Not possible



(b)

i) **Rainfall reliability:** *Predictability*

This determines the time of land preparation and planting.

ii) **Amount of rainfall** is the quantity of rain that falls in a given area ~~within a given area within a given year~~. Determines the type of crops to be grown and ~~livestock to keep~~.

iii) **Rainfall distribution** *Pattern* is the number of wet months in a year. Influences choice of crop varieties to grow.

iv) **Rainfall intensity:** This is the amount of rain that falls in an area within a period of one hour. Rainfall of high intensity ~~damages crops and causes soil erosion~~. *Should be correct to prevent damage to crops & soil erosion*

(8 marks)

(c)

i) **Aerial layering/marcotting:** Bark and cambial layer are removed from a section of the branch, moist ~~rotting~~ *rotting* medium is heaped around the section and wrapped with a polythene sheet;

ii) **Tip layering:** Shoot with a terminal bud is bent to the ground and covered with a layer of moist soil;

iii) **Trench layering:** A branch is bent, laid in a trench and held in position using pegs; and covered with a layer of moist soil;

iv) **Compound/serpentine layering:** a branch is bent several times and held using pegs. Bent parts are covered with a layer of moist soil; *Stool and mound*

v) **Shoot or mound layering:** soil is heaped around the base of the stem which gives rise to new shoots;

5 x 1

(5 marks)

(d)

i) **Regulate and control of production, ~~grading and marketing of the~~ *of* specific products.**

ii) **Licensing production and export.**

iii) **Quality control**

iv) **Carrying research on different aspects of the crop or livestock in question on behalf of the government.**

v) **Acting as the sole agents on all matters concerning the crop or livestock.**

vi) **~~Processing and marketing~~ *of* of processed products.**

vii) **Advising the Minister for Agriculture on the importation or exportation of the products in relation to their availability.**

viii) **Provide and co-ordinate ~~and corporation~~ *of* different sectors *of production*.**

5 x 1

(5 marks)

*marketing*  
*marketing*  
*carrying out marketing functions like grading, processing, storing, packing, packaging, selling, financing, marketing*  
X) *Advise farmers on different aspects of product*  
xi) *Provide farmers with input at low prices*



(i) Clear the land

Land prep	<p>22. (a) (i) Rice fields are levelled; and bunds constructed around them for controlling water level;</p> <p>(ii) Tractor drawn rotavators are used to prepare flooded fields;</p> <p>(iii) Digging with jembe is also used to prepare before the fields are flooded;</p> <p>(iv) Flood the fields.</p> <p>(v) Water level in the field is increased from 5cm at planting time gradually to 15cm when seedlings are fully grown.</p> <p>(vi) Water is allowed to flow slowly in the fields.</p> <p>(vii) Where flow is not possible, old water should be drained and fresh water added every 2 – 3 weeks.</p> <p>(viii) Weeds are controlled by flooding.</p> <p>(ix) Surviving weeds are controlled by uprooting.</p> <p>(x) Effective herbicides can also be used.</p>	<p>3 x 1 (3 marks)</p> <p>3 x 1 (3 marks)</p> <p>2 x 1 (2 marks)</p>
Land prep	<p>(b) (i) Clearing of land;</p> <p>(ii) Primary cultivation;</p> <p>(iii) Secondary cultivation to fine tilth</p> <p>(iv) Prepare land early before onset of rain</p> <p>(v) Planting of millet</p> <p>(vi) Early; planting by broadcasting/row planting at 30x33 cm spacing</p> <p>(vii) Seed rate should be 3-5 kg/ha</p> <p>(viii) Harvesting of millet</p> <p>(ix) Individual heads are cut using knives/sickles</p> <p>(x) The heads are dried</p> <p>(xi) The dry heads are threshed and winnowed</p> <p>(xii) Seeds are winnowed</p> <p>(xiii) Timely harvesting when heads are dry</p>	<p>2 x 1 (2 marks)</p> <p>2 x 1 (2 marks)</p> <p>3 x 1 (3 marks)</p>