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 = 2mrks.

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 of controlling pests & weeds
 - Safe disposal of effluents from farms
 - 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 make select choice on which enterprise(s) amongst many to use the limited resources (Mark as a whole)

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

- The total field per unit area is low
- A lot of time wasted when farmer is shifting and building new structures
- Farmers have no incentives to develop land and conserve water & soil
- Not applicable in areas of high population density or where there is high population increase.
- Should be practised where land is abundant/adequate/communally ow
- 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 eg 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 of a Permanent Project
- owners of land can lease/sell all or part of land together that
- 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.

14. State **four** reasons for carrying out minimum tillage. (2 marks)

- 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

15. Name **four** financial documents used in farm accounting. (2 marks)

- 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.

E   F   G

(a) Identify the weeds labelled **F** and **G**.

F Black Jack (Bidens pilosa) .... (1 mark)

G Stinging nettle (Urtica Massaica) .... (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)

$\frac{120 \times 100 kg}{46}$ urea = 260.87kg urea.

46kg N — from 100 kg urea

so 120 kg N → $\frac{100 \times 120}{46}$

= 260.87 kg

ii) SSP (20% P_2O_5)

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

20 kg P_2O_5 — from 100 kg SSP

60 kg P_2O_5 → $\frac{100 \times 60}{20}$ = 300 kg SSP

iii) KCl (50% K_2O)

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

50 kg K_2O — from 100 kg Kcl

so 80 kg K_2O → $\frac{100 \times 80}{50}$

= 160 kg Kcl

Plus 1 mk 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 200 m long and 36 m wide. If the farmer plants beans at a spacing of 30 cm × 15 cm, calculate the plant population on the piece of land. Show your working. (5 marks)

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

$$= \frac{36 \times 200 \, m^2}{0.3 \, m \times 0.15 \, m}$$

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

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

(D) Plant Population

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

Area of land $= 20000 \times 3600$
$= 72000000 \, cm^2$

Spacing = 30cm × 15cm
Area occupied by one plant = 30 × 15
$= 450 cm^2$

∴ Plant Population $= \frac{72000000 \, cm^2}{450 \, cm^2}$
$= 160,000 \text{ plants}$

(A) $$\frac{\text{Area of land}}{\text{Spacing}}$$

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

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

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

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

(B) $$\frac{\text{Area of land}}{\text{Spacing}}$$

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

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

$$= \frac{720\,000\,000}{450}$$

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

(C) $$\frac{\text{Area of land}}{\text{Spacing}}$$
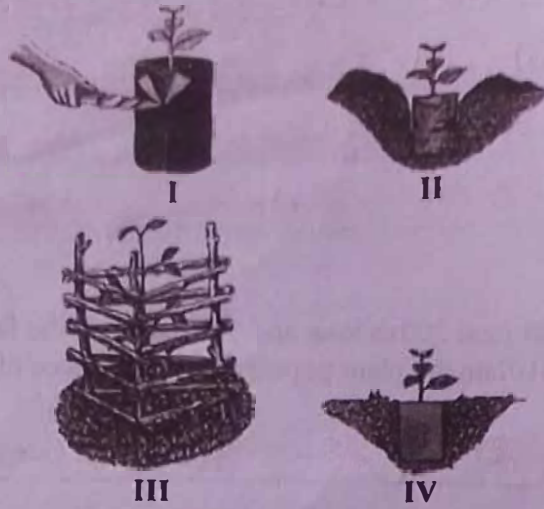
Area of land
$= 200m \times 36m = 7200 m^2$

Spacing $= 0.3 \times 0.15 \, m^2$
Area occupied by one Crop $= 0.3 \times 0.15m^2$
$= 0.045 \, m^2$

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

19. The diagram below shows a practice in agroforestry.

I   II

III   IV

(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 holes.

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

                                                       (1 mark)

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

SECTION C (40 marks)

20(a)	i) Medical facilities ii) Housing iii) Security iv) Rewarding good workers v) Better remuneration vi) Transport provision vii) Protective clothing/uniform viii) Bonus ix) Safe working environment		
		7 x 1	(7 marks)
(b)	(i) Blossom end appears rotten; water soaked; dry;	1 x 1	(1 mark)
	(ii) i) Too much nitrogen in early growth stages ii) Irregular or infrequent watering iii) Calcium deficiency	3 x 1	(3 marks)
	(iii) i) -Regular watering ii) Top dressing the crop with the right amount of nitrogen iii) Application of calcium compound fertilizers in the soil	3 x 1	(3 marks)
(c)	i) Threshing: Removal of beans from pods to facilitate cleaning and storage. ii) Drying: Beans are dried to attain correct moisture content for storage to prevent rotting. iii) Cleaning: To remove foreign materials before storage. iv) Sorting and grading: Sorted and graded according to the quality. v) Dusting: Applying chemical powders on seeds to prevent attack by storage pests. vi) Packing: Beans are placed into containers for storage.	6 x 1	(6 marks)
21. (a)	i) Slow growth rate of crops as the process of photosynthesis is slowed. ii) High incidence of disease infection to crops, e.g. CBD, hot and cold disease of coffee; iii) Quality of crops, e.g. tea and pyrethrum is improved	2 x 1	(2 marks)

Handwritten annotations (20a): x) Mechanization/provide good working tools; xi) Provide recreational facilities; xii) Provide social amenities eg schools for their children.

Handwritten annotations (c): by beating with sticks; Bean plants spread on mats in the sun to dry; by winnowing; beans/seeds are sorted to separate good from bad; grading seeds are classified according to size or quality; packing.

Handwritten (21a): disease infection eg rust in coffee; since crops eg fruits; Covered/Quality of crops is affected.

Right margin: Not processed.

(b)

i) **Rainfall reliability:** /Predictability.
This determines the time of land preparation and planting.

ii) **Amount of rainfall** (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** (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.   4 × 2   (8 mar

(c)

i) **Aerial layering/marcotting:** Bark and cambial layer are removed from a section of the branch, moist ~~rotting~~ rooting 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) ~~Simple or Ground~~ **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~~ 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 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~~ different sectors of production.   5 x 1   (5 marks)

ix) Carrying out marketing functions like (grading, procuring, storing, packing, packaging, selling, financing, market r...

x) Advising farmers on different aspects of product...

xi) Provide farmers with inputs at low prices

22. (a) (i) *(i) Clear the land*

Rice fields are levelled; and bunds constructed around them for controlling water level;

Tractor drawn rotavators are used to prepare flooded fields;

Digging with jembe is also used to prepare before the fields are flooded;

(v) Flood the fields.

3 x 1 (3 mar

Land prep

(ii) Water level in the field is increased from 5cm at planting time gradually to 15cm when seedlings are fully grown. / *Maintain water level at*

Water is allowed to flow slowly in the fields.

Where flow is not possible, old water should be drained and fresh water added every 2 – 3 weeks.

Drain water completely before harvesting.

3 x 1 (3 mark

Water ctrl

(iii) Weeds are controlled by flooding.

Surviving weeds are controlled by uprooting.

Effective herbicides can also be used. / *Apply propanyl / Butachlo*

2 x 1 (2 marks

Weed ct

(b) (i) Clearing of land;

Primary cultivation;

Secondary cultivation to fine tilth / *secondary cultivation to fine tilth*

2 x 1

Prepare land early / Before onset of rains

(2 marks)

Land prep

(ii) **Planting of millet**

Early; planting by broadcasting/row planting at 30x33 cm spacing / *60 cm x 5 cm*

2 x 1 (2 marks)

Seedrate should be 3-5 kg/Ha

(iii) **Harvesting of millet**

Individual heads are cut using knives; / *sickles*

The heads are dried.

The dry heads are threshed and winnowed.

Seeds are winnowed / when heads are dry.

Timely harvesting

3 x 1 (3 marks)