

**QUESTIONS AND MODEL ANSWERS**

**FOR**

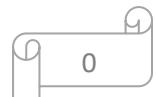
**AGRICULTURE**

**FORM 3 & 4**

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**@2023**

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# SECTION 1: THEORY QUESTIONS

## First Paper

**1 a. Give any two chemical properties of soil**

- *Soil PH,*
- *Nutrient status,*
- *Soil salinity and*
- *Cation exchanging capacity.*

**b. Explain one influence of the following physical properties of soil on crop production**

i. **Soil colour**

- *Increased soil temperature increases the rate at which minerals dissolve and become available for plant use.*
- *Increases rate of seed germination by increasing the rate at which enzymes can break down reserved food to give energy to the developing embryo.*
- *Soil colour indicates the suitability of the soil for specific crops. For example, grey soil indicates that the soil waterlogged hence no choice of rice.*
- *Black or dark colour signifies soil is rich in nutrients required by crop growth and development.*
- *Greyish or whitish indicates poor drainage or high-water holding capacity which resulted to poor plant growth. (2 marks)*

ii. **Soil temperature**

- *Rate of evaporation and transpiration is high when the soil temperature is high*
- *Absorption and transport of water and nutrients by plants is low when temperature is low.*
- *High temperatures increase activities of microorganism in the soil eg nitrification*

- *Seed germination and root growth is fast when soil temperature is high.*
- *High soil temperatures increase chemical reaction in the soil hence more mineral salts dissolve into soluble minerals which become available for plant use.* (2 marks)

c. Give two effects of climate change on

i. land.

- *Land In areas resulted to high rainfall hence flooding and loss of soil fertility.*
- *Erratic rainfall lowers water table resulted to low vegetative growth hence land degradation.*
- *Acidic rainfall lower soil PH hence high level of acid soil.*
- *High rainfall resulted to landslide or mud slide which degrade the land for agricultural activities.*

ii. Crops

- *Crops Erratic rainfall results in failure in crop production.*
- *High rainfall resulted in washed away of crops due to flooding.*
- *Storms lead to crop logging.*
- *High temperature results to increase in multiplication of pests and pathogens which lower crop yield.*
- *Hailstorm may cause damage to crops.*
- *Low temperature and high temperature may result to in active or death of some beneficial organism such as pollinators hence lowering plant yield.* (2 marks)

2 a. State any two principles of conservation agriculture

i. *Maximum soil cover*

ii. *Crop rotation and mixing cropping*

iii. *Minimum soil disturbance (no tillage)* (1 mark)

**b. Explain any one importance of integrated fish farming system on small holder farmers.**

- *Manure from livestock help to fertilize the ponds.*
- *Water from the ponds is used to irrigate maize fields in dry season*
- *Farmers grow cash crops like bananas around the banks of their ponds.*
- *Pond sediments are used as manure*
- *Fish meals are used to feed poultry.* (2 marks)

**3. a. Define price elasticity of demand**

- *Price elasticity of supply is the extent to which the supply of a commodity changes as a result of a change in the price of a commodity or*
- *It is the measure of the level of response of supply to change in price.*
- *Or is the degree to which demand respond to change in price of the commodity.*

(2 marks)

**b. Table 1 below shows the demand schedule of tomatoes at Ndirande market in Blantyre city. Use it to answer questions that follow.**

Price in kwacha	Quantity demande $d$ in kg
100	200
80	300
60	400
40	500
20	600

**Calculate the price elasticity of demand of tomato at Ndirande market. (6 marks)**

$$PED = \frac{\% \text{ change in demand}}{\% \text{ change in price}}$$

$$\% \text{ change in demand} = \frac{\text{Original Qnty dd} - \text{New Qnty dd}}{\text{Original Qnty dd}} \times 100$$

$$= \frac{200 - 300}{200} \times 100$$

$$= 50\%$$

$$\text{Change in price} = \frac{\text{original Price} - \text{New Price}}{\text{Original Price}} \times 100$$

$$= \frac{100 - 80}{100}$$

$$= 20\%$$

$$P E D = \frac{50\%}{20\%}$$

2.5. Answer

**c. State the degree of the price elasticity of demand for tomato at Ndirande market**

- *Elastic demand (1 mark)*

**d. State any two examples of physical marketing function**

- *Storage*

- *Processing*
- *transportation* (2 mark)

4. A livestock farmer in Malingunde can rear dairy cattle or sheep. If the farmer undertakes each of the enterprises at a time, he is likely to get returns and make expenses as follows:

	Dairy cattle	Sheep farming
Income	K85,000	K70,000
Cost of feed	K15,000	K 8,000
Casual Labour	K 8,000	K 4,000
Immunization	K 4000	K 2,000

a. Show by calculation the enterprise the farmer should engage in (4 marks)

<i>Dairy cattle</i>	<i>sheep farming</i>
$K85000 - (15000 + 8000 + 4000)$	$K70000 - (8000 + 4000 + 2000)$
$K85000 - (27000)$	$K70000 - (14000)$
$K58000$ (2 marks)	$K56000$

b. What is the opportunity cost of undertaking the enterprise chosen in (a) above?

- *Opportunity cost is k2000.* (1mark)

c. Mention the differences between partial and complete budget.

<i>Complete budget</i>	<i>Partial budget</i>
<i>It is adopted when there is a major change in the farm</i>	<i>It is adopted when there is minor change in the farm</i>
<i>Both fixed and variable costs are calculated for working out costs and returns.</i>	<i>Only variable costs are considered</i>
<i>It requires more efforts and time for preparation</i>	<i>It requires relatively less efforts and time for preparation.</i>

(2 marks)

5. a. Explain two factors to consider when feeding poultry.

- *Age and size of the animal, young animals require less feed than larger animals.*
- *The type of animal, ruminant animal can digest roughages while most non ruminant animals cannot.*
- *Purpose for which animals are kept, draught animals require high energy feed while animals which produce milk, meat and eggs need concentrates,*
- *The condition of the animal.*
- *The quality of the feed, the feed should be easy to ingest and digest.*
- *Palatability, the feed should be appetizing to animals with good taste and smell.*
- *Digestibility refers to the ability of the feed to be digested by an animal.*
- *Texture of feed, refers to the coarseness or fineness of the feed. Chickens for example prefer coarse feed.*
- *Cost of the feed, a farmer should ensure that feed is given to animals that are productive.*

**b. Give two reasons why should farmers ensure that young animals up to the age of six months should be given milk not roughages**

- *It contains anti bodies which protect calves from diseases*
- *Digestive system of calves is not yet matured to accommodate course feeds.*

**6. a. Give the importance of the following stages in hybridization**

**i. Selfing parental lines**

- *It helps to produce pure lines.* ( 1 mark)

**ii. Cross pollinating pure lines**

- *To come up with a new hybrid variety possessing all characteristics.* ( 1 mark)

**b. Give the meaning of the following in mushroom production**

**i. Mushroom Substrates**

- *It refers to materials in which mycelium or mushroom grows*
- *It is a material rich in organic materials and is used for growing mushroom.*

(2 marks)

**ii. Mushroom casing**

- *It is a practice of applying well prepared organic matter rich soil or peat moss over the spawns or mushroom seeds.*

**7 a. Explain one way in which of the following agricultural technologies mitigate the effects**

**of climate change.**

**i. Water harvesting technology**

- *Harvested water can be used to irrigate crops in dry season*
- *Harvested water can be used for drinking for both livestock and people*
- *Harvested water can be used in agro based industries for processing and cleaning farm produce.*

- *Harvested water can be used for constructing animal houses and crop storage structures.*  
(2 marks)

## ii. **Agroforestry**

- *Agroforestry trees add nutrients to soil*
- *Agroforestry trees bring about rainfall*
- *Agroforestry trees act as windbreak*
- *Agroforestry trees provide shade to people and livestock*
- *Agroforestry trees reduce impact of raindrops hence reduce soil erosion*

(2 marks)

## b. Explain one way how pasture can control soil erosion

- *Pasture leaves cover the soil and protect it from splash erosion,*
- *pasture roots grass prevent erosion by bind the soil together*
- *Pasture stems grass such as star grass reduce run off.*

(2 marks)

## 8. a. Give the importance of the following practices in sheep production

### i. **Docking**

- *It prevents dirt and dung from collecting under the tail, which could otherwise be a source of infection.*
- *It helps in parasite control*
- *In fat-tailed sheep, docking helps to improve the quality of the meat*
- *It helps animals to mate easily.*

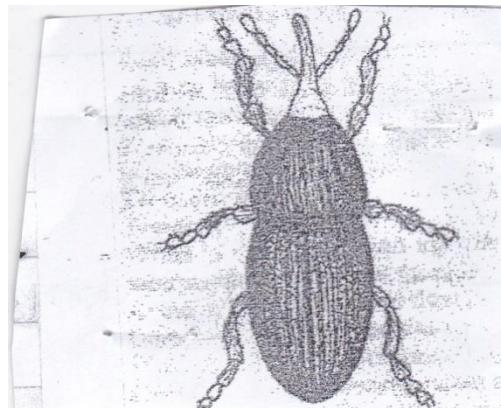
(2 marks)

### ii. **Trimming**

- *Prevent lameness*
- *For easy movement*

(2 marks)

**9. Study the figure 1 below and answer the followed questions.**



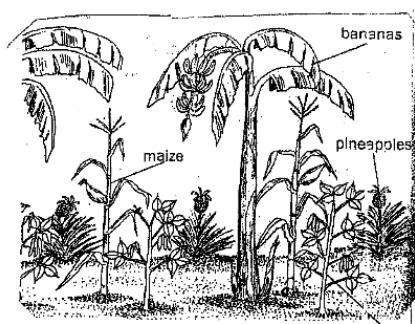
**a. Explain one type of damage that results from this storage pest on maize seeds**

- *Burrow holes on the maize seed*
- *Eat flour parts of maize* (2 marks)

**b. Give one cultural way of controlling this pest**

- *Early planting*
- *Crop rotation*
- *Mixing cropping* (1 mark)

**10. Figure 2 shows a cropping system. Use it to answer questions that follow.**



**a. Identify the cropping system.**

- *Mixing cropping* (1 mark)

**b. Explain any one way in which the system identified in (a) supports the growing population.**

- *Once one crop fails a farmer rely on other crops*
- *Enable the farmer to eat balanced diet*
- *Helps to control pests and disease since one crop act as a barrier.* (2 marks)

**c. State any two limitations of the cropping system identified in (a) to a smallholder farmers.**

- *High Labour demand.* (2 marks)
- *Difficult to mechanize the farm*
- *Difficult to apply chemicals*
- *Need large capital*
- *Require some skills*

## **SECTION B ESSAY QUESTIONS**

**11. Explain five ways in which nitrogen can be depleted from the soil**

- *Volatilization- nitrogen is released into the atmosphere as a gas through activities of the denitrifying bacteria.*
- *Immobilization- used by micro-organisms to build up their bodies.*
- *Absorption by plants and the consequent removal of crop plants (products) from the land through harvesting.*
- *Soil erosion carries away nitrates, together with the top soil, down the slope.*
- *Leaching. The nutrients (nitrates) are washed vertically down the soil profile to the water table beyond the root zone.)*

(10 marks)

**12. Describe any five factors that should be considered when mechanizing a farm.**

- ***Topography:*** Mechanization is easier on flat land than hilly land.
- ***Size of land:*** Heavy mechanization require large land, small holder farmers can make loss if they intend to use heavy machinery such as tractor on their farm.
- ***Technical know – how:*** Farm machinery require some skills to operate and maintain.
- ***Availability of capital:*** a lot of capital is required to purchase heavy machines such as tractor and plough.
- ***Value of crop:*** High value crop should be considered when mechanizing the farm. Low value crop can resulted to farmers making losses.
- ***Availability of good infrastructures:*** good roads and bridges are highly needed when mechanizing the farm.

(10 marks)

**END OF FIRST PAPER**

# **Second Paper**

1. a. State two problems associated with international trade

- **It retards the growth of small industries due to wider competition from cheap imports**
- **Language barrier. There might be communication breakdown due to different languages.**
- **High taxation**
- **Transmission of impurities such as weeds, diseases and pests.**
- **Wars**
- **Disruption of cultural values through modernization. Members of a country may copy bad cultural values from trading partners.**

b. Give two ways of improving international trade

- **Promoting good international relationships**
- **Encouraging production of a variety of agricultural commodities of high quality.**
- **Increasing transport and good storage facilities at ports of entry**
- **Improving advertisement and sales promotion e.g. trade fairs.**
- **Competitive pricing-reasonable prices**
- **Establishing stable and competitive exchanging rate.**
- **Improving the quality of agricultural products to attract external buyers e.g. quota system.**
- **Promoting Information Communication and Technology (ICT) that enhances e-commerce.**
- **Providing adequate information to potential exporters about international markets, the customers and procedure.**
- **Reducing or removing barriers to trade such as tariffs, import quotas, exchange controls, embargos and other technical barriers.**

c. What is the difference between one tier marketing channel and two tier marketing channel

- **In one-tier no middleman/intermediary is involved while in two-tier middlemen/intermediary are involved.** ( 2 marks)

2. Mr. Gama was unhappy with the yield of beans in his farm as such he decided to import seeds of a high yielding variety from Tunisia. However the imported bean variety did not perform well despite receiving adequate care.

a. i. Name the method of crop improvement Mr. Gama chose.

- **Introduction** (1 mark)

ii. Suggest the reason why the high yielding bean variety from Tanzania did not perform well in Mr. Gama's farm.

- **Environmental factors** (2 marks)

b. Give **two** objectives of crop improvement that are aimed at increasing quality of crops.

- **Colour**
- **Size**
- **Nutritive value**
- **Fibre**
- **Uniformity**
- **Sweetness.**

3. The table below shows some problems that a certain farmer faces. Use it to answer questions that follow.

PLOT 1	PLOT 2	PLOT 3
Lack of nitrogen	Heavily infested with witch weed	Heavily infested with aphids

a. If a farmer wants to grow cassava, maize and groundnuts, plan a rotation program for the first year by indicating the crop to be grown in each plot.

- Plot 1 groundnuts
  - Plot 2 cassava
  - Plot 3 maize
- (3 marks)

b. Give a reason for choice in plot 2.

- **Witch weed attack maize not cassava**
- ( 2 marks)

c. Name any groundnuts disease

- **Rosseta**
  - **early leaf spot**
  - **late leaf spot**
  - **rust**
- ( 1 mark)

d. Give one advantage of hallowing in maize production

- **It promotes water infiltration**
  - **Aeration in the soil.**
  - **It promotes easy germination**
  - **rapid root penetration**
- ( 2 marks)

4a. i. State **two** causes of soil salinity

- **Weathering of rocks which cause salts to accumulate in both surface and underground soil.**
- **Application of inorganic fertilizers**
- **Irrigating crops with salty water**
- **Poorly drainage**
- **Low rainfall and evaporation**

b. Give **one** way of correcting saline soils

- **Irrigating plants with free salty water**
- **Applying residue or mulch the soil to lower evaporation rate**
- **Adding high amount of free – salty water to soil surface to dissolve salt and them down the root zone.**
- **Adding acid formed chemicals to neutralize sodium salts.**
- **Deep tiling the soil to break up soil hard pans .This allow easy movement of water through the soil which dissolve salts.**

c. Give two biological way of conserving soil resource

- **planting vegetative cover, trees and grasses**
- **practicing agroforestry and crop rotation**
- **re-afforestation**
- **applying manure**
- **mulching**

5. Mr. Gama's farm has two tractors, 3 oxen and 20 litres of petrol for the tractors.

a. Write down any two forms of energy found on his farm.

- **Mechanical**
- **Animal and**

(2 marks)

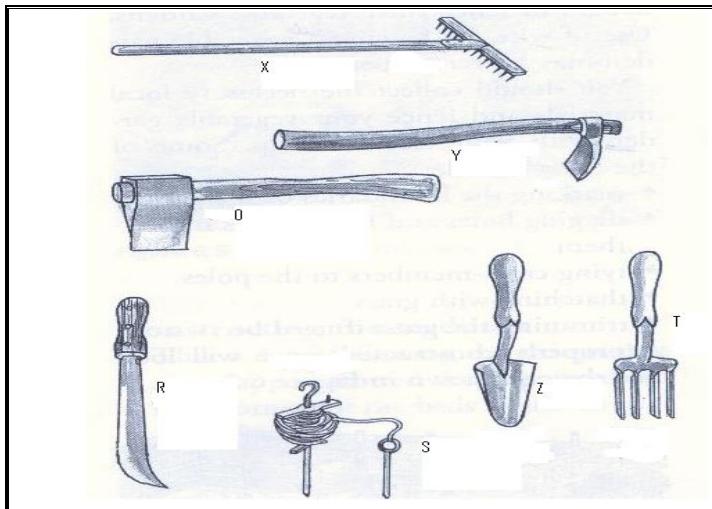
c. Explain **one** way in which Mr. Gama can keep himself and his family safe when handling the fuel energy.

- **Keep fuel away from children** ( 2 marks)
- **Keep fuel away from fire**

d. Give two ways of improving human power output in a farm

- **People should be given incentives such good payments and bonus.**
- **Provide them skills by training them**
- **Workers should eat enough balanced diet food**

6. Figure below is a collection of farm tools and implements. Use it answer below questions



a. Identify tools labeled **X** and **Z**

- **X: Rake** (1 mark)
- **Z: hand shovel/trowel** (1 mark)

b. Which tools does the farmer use for:

(i). Transplanting **Z/ (hand shovel/trowel)** (1 mark)

(ii). Leveling **X/Rake.** (1 mark)

7. a. Mention two exotic breeds of goats

- **Angora**
- **British Saanen**
- **British Alpine**
- **Toggenburg**

- **Angora**
  - **Boer goat**
- ( 2 marks)

b. Give two methods of castrating goats

- **Using burdizzo**
  - **Using a sharp knife**
  - **Using a strong rubber band or elastrator**
- (2 marks)

c. Give one reason for castrating goats

- **Castrated animals fatten up quickly and produce good quality meat**
- **Castration prevents the animals from passing less desirable characteristics to the next generation.**
- **It makes animals docile and easier to handle.**

(2 marks)

d. Mrs Kandiwo identify the following symptoms on her flock of sheep in her Chilamweni farm.

- Loss of appetite
- Coughing
- Difficulty in breathing

i. Mention the diseases that attack the animals.

- **Pneumonia**
- (1 mark)

Give one way of preventing the disease

- **Keep animals in a clean,**
- **Keep warm ventilated house**
- **Provide plenty of water and palatable feed**

Give one way of controlling the disease.

- **Treat with antibiotics.**
- (1 mark)

8. The **table** below shows results on maize variety trial conducted by form four students of Bangwe Day Secondary School. Use it to answer the questions that follow.

Variety A		Variety B		Plot
1	2	3	4	
100	110	135	95	<b>Yield (kg/200m<sup>2</sup>)</b>

Calculate average yield for each variety

i. variety A ( 2 marks)

$$\frac{100 + 110}{2}$$

$$= \mathbf{105}$$

ii. Variety B (2 marks)

$$\frac{135 + 95}{2}$$

$$= \mathbf{115}$$

b. Give one advantage of calculating the average yield in the experiment

- **It helps in comparing the results and coming with conclusion.** ( 1 mark)

c. What conclusion can be drawn from the experiment?

- **Variety B is better than A** ( 1 mark)

**9.** Table below shows marketing costs for bananas. Use it to answer the questions that follow.

Marketing Channel	Charges (MK)	Market Price (MK)
1. Farmer	-	100
2. Middleman		
- Transport	50	
- Profit	20	<b>170</b>
3. Processing companies		
-Processing	120	
-Canning	100	
-Profit	80	<b>470</b>
4. Retail		
-Transport	50	
-Advertising	50	
-Profit	200	<b>770</b>

a. What type of marketing channel is presented in the table?

- **Indirect marketing channel/4 tier marketing channel** (1 mark)

b. Calculate the marketing costs for Retailer (2 marks)

$$\text{MK}50 + \text{MK}50 + \text{MK}200 = \text{MK}300$$

c. Calculate total marketing margin for the whole marketing channel. (2 marks)

$$\text{Marketing Margin} = \text{Retailer Price} - \text{Farm Gate Price}$$

$$= \text{MK}770 - \text{MK}100$$

$$= \text{MK}670.$$

10 a. How the following plants are propagated asexually

i) Pineapples (1 mark)

- **suckers**

ii) Ginger

• **Rhizome** (1 mark)

iii) Irish potato.

• **Tuber** (1 mark)

11.a. Explain how the following factors affect enterprise combination

i. Land

• **Size of land determines type and size of an enterprise to engage in.** ( 2 marks)

ii. Profitability of an enterprise

• **Farmers opt to combine crops that can give them much profit or that maximise profit.**

(2 marks)

b. Give an example of enterprises that are complementary to each other.

• **Maize and beans**  
• **Cattle and beans**  
• **Fish and poultry.** ( 1 mark)

c. Explain how the principle of comparative advantage in agricultural is very important to smallholder farmers

• **Enable farmers to grow crops that best suit to their environment hence high production.** ( 2 marks)

## **SECTION B: ESSAY QUESTION**

12. Explain five ways of dealing with risk and uncertainty in agriculture production

- i. **Practicing mixed farming and mixed cropping.** A farmer would have something to depend on in times of crop failure.
- ii. **Insuring enterprises.** A farmer is compensated for any risk and eventuality that may occur on the farm
- iii. **Having sound net capital.** Used as a caution in times of price fluctuation.
- iv. **Guarding against theft and vandalism.** This helps to prevent of loss of produce to theft.
- v. **Input rationing to prevent wastage of production resources.**
- vi. **Contract farming to deal with price fluctuation.**
- vii. **Crop rotation helps a farmer to have something to depend in times of crop failure.**

13. Explain five importance of land drainage

- It reduces accumulation of dissolved mineral salts which become toxic if they dissolved in excess.
- It modifies soil temperature, too much water lowers soil temperature.
- It improves soil structure
- It reduces leaching. Dissolved minerals in the soil are prone to leaching if excess water remains in the soil.
- It reduce incidence of soil and water-borne pest and diseases such as bilharzia
- It is the method of land reclamation by increasing land available for crop production.
- It increase soil aeration since water occupied in air space is removed
- It promotes activities of micro-organism there by improving the rate of decomposition of organic matter.

14. People in Nkhono area have the following resources at their disposal;

- Herbage which is abundant in dambos during rainy seasons
- Infertile loamy sand soils
- A lot of livestock
- A savings and credit cooperative
- An agricultural extension worker

How can the farmers use the above resources above to maximise agricultural production.

- **Herbage provides feeds to livestock hence increasing the production.**
- **Manure from livestock improve infertile loamy soil hence crop production**
- **A saving and credit cooperatives provide loan to farmers to buy expensive farm machinery or enough land for increased production.**
- **Extension workers provide advice and equip knowledge to farmers on agriculture production hence farmers are able to increase the production.**
- **Livestock can be trained to cultivate the land thereby increasing hectares for cultivation.**

(10 marks)

**END OF SECOND PAPER**

# Third Paper

1. a. Give any **one** ways in which inoculation of pasture seed is important.
  - *To encourage nodule formation/ hence promoting nitrogen fixation.* (2 marks)
- b. State the **two** main aims of crop improvement.
  - *To increase the crop yield quantity*
  - *To increase crop yield quality* (2 marks)
2. a. State any **one** way in which each of the following can reduce risks and uncertainties on a farm.
  - i. Selecting a more reliable enterprise
    - *The chosen enterprises are able to produce despite environmental hazard conditions (such are drought, parasites, pests and diseases).* (1 mark)
  - ii. Input substitution
    - *It enables farmers not spend much on farm inputs (use of locally prepared inputs other than use of commercial inputs)* (1 mark)
- b. State any **two** ways in which trading at national level can ensure food supply.
  - *Urban population are able to obtain food through trading or enables urban population to obtain food through economic means.*
  - *The marketing boards buy foods from different parts of the country and store it in national stores so that it can be sold in times of food shortage.*
  - *Enterprise specialisation leads to increased food production hence enough food for everyone.*
  - *Creation of job opportunity enables people earn income and buy food enough for themselves.*

- *Promotion of local industrialization enables food processing hence easy storage (improves nutritional value through addition of some nutrients).*

(2 marks for any two)

c. Give any **two** methods of advertising agricultural products in highly populated areas.

- *Mass media (Newspaper, Radios and Television)*
- *Trade fair*
- *Exhibition*
- *Agricultural shows*
- *Use of bill boards (posters)*
- *Use of internet*

(2 marks for any two)

d. Explain any **one** disadvantage of an indirect marketing channel to the farmers.

- *Farmers gets less profits<sup>1</sup>/ since most middlemen exploit them by buying farm produce at a lower price.*

(2 marks)

3. Explain any **one** way in which each of the following agricultural practices can help to control soil degradation.

i. Afforestation

- *Tree leaves forms a canopy<sup>1</sup>/ hence protecting soil from direct rain drop impact which results into soil erosion OR Tress intercept raindrops<sup>1</sup>/ hence reduce their impact on soil hence reducing erosion.*
- *Trees acts as a wind break<sup>1</sup>/ hence preventing soil erosion<sup>1</sup>*
- *Decomposed tree leaves releases nutrients to the soil<sup>1</sup>/ hence increasing soil fertility<sup>1</sup>.*
- *Tree roots bind the soil particles together<sup>1</sup>/ hence preventing soil from erosion<sup>1</sup>.*

(2 marks for any one)

ii. Rotational grazing

- *Allows pasture to recover and form a soil cover<sup>1</sup>/ hence reducing water run-off that leads to erosion<sup>1</sup>.*

(2 marks)

4. a. Give any **two** advantages of mushroom production.

- *Provide source of job opportunity*
- *It is a rich source of nutrients*
- *Used to cure some diseases*
- *Provides good source of income.*

(2 marks for any two)

b. Mention any **two** sources of power for operating a ridger on a farm.

- *Human power*
- *Mechanical power (tractor)*
- *Animal power*

(2 marks for any two)

c. A farmer wants to establish a grass pasture using the following information:

- Seed size = 300,000 seed/kg
- Purity% = 75%
- Germination = 85%

If the farmer expects to have 800,000 plants per hectare, calculate the seed rate of the grass pasture.

### Solution

$$\text{Seed rate} = \frac{\text{expected plant population}}{\text{seed size} \times \text{germination percentage} \times \text{germination percentage}}$$

$$= \frac{800,000 \text{ plants/hectare}}{300,000 \text{ per kg} \times 85\% \times 75\%}$$

$$= \frac{800,000 \times \text{Kg}}{1 \text{ hectare} \times 300,000 \times 0.85 \times 0.75}$$

$$= \frac{800,000\text{kg}}{191\,250 \text{ hectares}}$$

**Seed rate = 4.2kg/hectare**

**Note: Each stage carries 1 mark except for the formula)**

**(Total 3 marks)**

5. a. State any **one** quality of a good pig house.

- **Should be well lit**
- **Should be well ventilated**
- **Should have strong walls**
- **Should have adequate space**
- **Should have a thatched roof**
- **Should have a concrete floor**
- **Should have an area for exercise and wallowing**
- **Should have separate pens for farrowing, creep feeding/ fattening/ breeding.**

**(1 mark for any one)**

b. Explain **one** way in which break even analysis is important in maize production.

- **Enables a farmer determine amount of yield required<sup>1</sup>/ in order to break the even<sup>1</sup>.**
- **Enables a farmer determine required price per unit product<sup>1</sup>/ in order to break the even<sup>1</sup>.**
- **Prepared when expecting unfavourable conditions such change in government policies, inflation or low prices for commodities.**
- **Helps to identify minimum output that must be exceeded in order to make profit.**

**(2 marks for any one)**

c. Describe any **two** preventive measures of diseases of pigs.

- **Add iron to feed or inject piglets with iron<sup>1</sup>/ in order to protect pigs from anaemia<sup>1</sup>.**
- **Immunise (vaccinate) piglets<sup>1</sup>/ to avoid African swine fever, Hog cholera<sup>1</sup>.**
- **Separate healthy pigs from sick pigs<sup>1</sup>/ in order to prevent further spread of the disease<sup>1</sup>.**
- **Ensuring general hygiene<sup>1</sup>/ in order to prevent further spread of the diseases on the farm<sup>1</sup>.**
- **Inject pig with suitable antibiotics into the udder<sup>1</sup>/ in order to avoid mastitis<sup>1</sup>.**
- **Kill and bury all infected pigs<sup>1</sup>/ to avoid the spread of the disease<sup>1</sup>.**

**(4 marks for two)**

d. State any **one** signs of heat in cows.

- *Clear mucus discharge from the vulva*
- *A moist red and swollen vulva*
- *Frequent urination*
- *Frequent mooing*
- *Restlessness*
- *Mounts on other cows and stand still when mounted*
- *Loss of appetite*
- *Drop in milking production*
- *Rise in body temperature.*

(1 mark for any one)

e. Explain any two ways in which feeding layers is important

- *To promote rapid growth of the pullets<sup>1</sup>/ so that can reach laying stage faster<sup>1</sup>.*
- *To increase the productivity of layers<sup>1</sup>/ since they tend to lay more eggs when they are well fed<sup>1</sup>.*
- *Improve health status of livestock since the feed contains the nutrients that prevent deficiency diseases.*

(4 marks, 2 marks each point)

6. a. Explain any one way in which each of the following activities is important in agricultural research:

i. Observation and measuring plants in the net plots

- *They are less affected by external factors<sup>1</sup>/ hence able to give accurate results<sup>1</sup>.*

(2 marks)

ii. Analysing data

- *Makes comparison of the treatments easier<sup>1</sup>/ hence able to give an accurate judgement or recommendation.*

(2 marks)

b. Explain any one way in which variety trials in agriculture could ensure food security.

- *Helps in developing a high yielding crop variety hence having enough food to meet people's needs.* (2 marks)

c. A farmer in area A has soil which favours the growing of tea and Pineapples. Another farmer in area B has good climate conditions for growing vegetables such as Irish Potatoes and tomatoes.

- (i). What economic principle is being used in choosing the enterprise?
- *Comparative advantage.* (1 mark)
- (ii). Explain **one** way how the economic principle in (C.i) can help to maximise Production
- *The farmer chooses and concentrates on an enterprise that best suit the environment hence high production.* (1 mark)

d. Explain the following terms as they are used in agricultural production:

- i). liquid capital.
- *Thus cash available on the farm, it is also called liquid<sup>l</sup>/ since it can be changed into any form of farm capital<sup>l</sup>.* (2 marks)
- ii). Working capital
- *Thus farm inputs available, they are also called working capital<sup>l</sup>/ because they get used up during production process<sup>l</sup>.* (2 marks)

7. a. State any **two** straight fertilizers that can be used to correct deficiency of potassium.

- *Murate of potash (Potassium Chloride)*
- *Potassium sulphate (sulphate of potash)* (2 marks)

b. State any **two** habits which result into food insecurity in Malawi.

- *Preparing too much food comparing to the number of people who are going to eat the food.*
- *Depending on one type of food crop such as Maize only or rice only or cassava only.*

(2 marks)

8. a. Name any **two** disadvantages of extensive farming system.

- *Low yield due to low use of inputs and technology*
- *It requires large land to produce enough food for population.*
- *It exposes the land to erosion leading into land degradation.*

(2 marks for any two)

b. State any **two** forms of mixed cropping practiced in Malawi.

- *Intra-row mixed cropping*
- *Inter-row mixed cropping*
- *Relay mixed cropping/ phase cropping*

(2 marks any two)

9. a. Describe any **one** factor that affect the rate at which animals reach Puberty.

- *Breed of the animal<sup>1</sup>. Exotic breeds reach puberty stage much earlier than indigenous breeds<sup>1</sup>*
- *Nutrition<sup>1</sup>. Animals that are well fed reach puberty much earlier since they get enough nutrients for growth<sup>1</sup>.*
- *Exposure to opposite sex<sup>1</sup>. Heifers that are kept together with bulls reach puberty earlier.*
- *Animal type. Dairy cattle reach puberty much earlier than beef cattle<sup>1</sup>.*

(2 marks for any two)

b. Explain any two ways in which budgeting is important to a livestock farmer.

- *Helps to avoid over expenditure<sup>1</sup>/ since the farmer will stick to his or her budget<sup>1</sup>.*
- *Helps in allocating resources to various enterprises that will compete wisely<sup>1</sup>/ in order to increase profit<sup>1</sup>.*
- *Shows the farmer the expected profit well in advance<sup>1</sup>/ hence can choose or eliminate some enterprises intelligently<sup>1</sup>.*
- *Tells the farmer what cost or expenses to expect<sup>1</sup>/ hence in preparing and financing the farm activities<sup>1</sup>.*

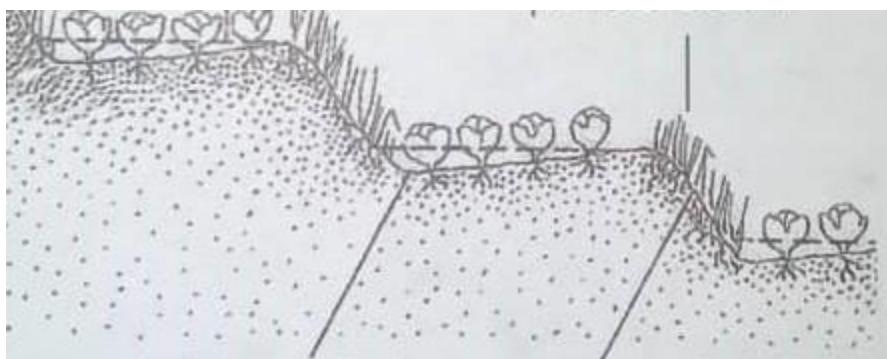
(4 marks for any two)

c. Give any **two** risks and uncertainties affecting vegetable production.

- *Pests and diseases*
- *Hailstorms*
- *Theft*
- *Vandalism*
- *Drought*
- *Price fluctuation*
- *Lack of inputs.*

(2 marks for any two)

10. The following figure shows a method of conserving soil. Use it to answer questions (i) and (ii).



i. Name the method of soil conservation shown in this figure.

- *Physical method (Terracing)* (1 mark)

ii. Explain any one way in which the physical structure can help to conserve soil and water.

- *It reduces water run-off<sup>1</sup>/ hence prevention soil erosion that result into soil degradation<sup>1</sup>.* (2 marks)

## Section B (30 marks)

11. Explain any **five** roles performed by agricultural marketing boards on marketing of agricultural produce.

- *Buying agricultural commodities. Marketing boards buy commodities from farmers, itinerant traders, processors and middlemen.*
- *Store the commodities in the warehouses. The stored commodities are released in time of need.*
- *Provide market information. Thus through advertising that they are buying and selling commodities at particular price.*
- *Selling commodities. It is also involved in selling the commodities obtained from different suppliers to potential customers at a profit.*
- (10 marks)

12. Briefly explain **five** ways of dealing with gender biases in agricultural technology.

- *Put more women on political arena<sup>1</sup>/ so that can make decisions pertaining to their gender parities and involve them in agricultural policy formulation<sup>1</sup>.*
- *Improve access to education by both male and female<sup>1</sup>/ so that can understand technological information without problems<sup>1</sup>.*
- *Promote equal skill development among the males and females<sup>1</sup>/ so that both can develop confidence in using agricultural technologies<sup>1</sup>.*
- *Reducing work burden of women<sup>1</sup>/ so that can have enough time to seek for technological information<sup>1</sup>.*
- *Review land and property ownership laws<sup>1</sup>/ to enable women own and control land so that can use it as collateral to get loan buying farm machinery<sup>1</sup>.*
- *Developing documentaries of successful women to serve as role models to other women<sup>1</sup>/ so that can be encouraged to use technological items<sup>1</sup>.*

- *Enlightening the general population on the important contribution that women can make in agricultural development and view them as partners in development not as subordinates.*
- *Discrediting gender stereotypes<sup>1</sup>/so that women can participate in using any agricultural technology<sup>1</sup>.* *(10 marks for any five)*

13. A certain village community has the following resources at its disposal:

- Plenty of Stock feed
- A hatchery
- Fish pond
- White Leghorns (Poultry)

Assuming that you are an agricultural field assistant, explain any five pieces of advice that you would give to this village commodity on how to fully utilize these available resources in order to increase agricultural production.

- *A farmer should make use of plenty stock of feed to fed poultry. Proper feeding improves the productivity of layers since they tend to lay more eggs if given adequate feed.*
- *Maximise poultry production so that can get more income and improve the living standard.*
- *Use a hatcher for breeding his poultry hence more number of poultry that will surely bring a lot of income after sales.*
- *The manure obtained from poultry farming will be used to promote growth of planktons in fish pond hence increasing the productivity of fish farming.*
- *The fish bones will be processed into nutritious feed for poultry hence high poultry production.*

*(10 marks for five points)*

**END OF THIRD PAPER**

# **Fourth paper**

1. a. State any **two** effects of gender bias in agricultural technology.
  - Low agricultural productivity
  - Low farm income
  - Food insecurity and starvation
  - Poverty
  - Slow agricultural development
  - Low contribution from one gender to agricultural production

(2marks for any 2)
  
- b. Explain any **two** ways in which improved technology affects food security.
  - Increasing productivity
  - Reduce post-harvest loses
  - Improved nutritional content of food
  - Reducing food wastage
  - Processing of food
  - Increasing profits

(2marks for any 2)
  
- c. Give any **two** importance of agricultural infrastructural services to the growing population.
  - Facilitating the transportation of farm inputs
  - Increase yields in agriculture
  - Enabling the transportation of farm produce to markets
  - Promoting use of improved technology
  - Attracting companies
  - Promoting agricultural trade
  - Improving farm income.

(2marks for any 2)

2. **Figure 1** is a diagram showing livestock parasites labelled **R** and **S**. Use it to answer the questions that follow.



**Figure 1**

- a. Identify the parasites labelled **R** and **S**

- **R** tsetse fly
- **S** liver fluke

**(2 marks for any 2)**

- b. Name any **one** farm animals that are usually attacked by parasite **R**

- Pig, goat, sheep, cattle, poultry. **( 1mark for any one)**

- c. State **two** damages which are caused by parasite labelled **S** in livestock production.

- It causes digestive upset / due to the blocking of the bile duct
- It causes the animals abdomen to swell / leads to loss of appetite
- Emaciation (thin) / which results in death of the animal.
- It also cause anaemia / due to the destruction of liver tissues
- Oedema in the jaw (swollen lower jaw) **(2 marks for any two)**

3. a. List any **two** local varieties of mangoes that are farmers grow in Malawi.

- kapantha, boloma, domasi, waka, dodo **(2 marks for any two)**

- b. Give **one** reason why growing of mangoes is important Malawi.
- They are source of raw materials in agro- based industries
  - Source of food as mangoes are rich in vitamins, calcium iron etc.
  - Source of income to farmers
  - They provide employment to the people
- (1 mark any one)**

- c. A farmer observes the following in mangoes.

- withering and dying of flowers before fruits form.

- irregular patches on the leaves.

i. Name the disease that has attacked the mangoes.

- Mango anthracnose (*colletotrichum gloeosporioides*)
- (1 mark)**

ii. Describe any **one** way of controlling the disease above.

- Use of resistant varieties / which are resistant to anthracnose.
- Remove dead branches, twigs and dead leaves / and destroy them.
- Spray appropriate fungicides / during flower bud formation, flowering and fruit setting

**(2 marks any two)**

4. A farmer, sold 30bags of maize at K10,000/bag to an itinerant trader who wants to sell maize to the final consumer, therefore he perform some marketing functions to the maize and incurred the following costs.

• Transport	K10,000
• Sacks	K 6,000
• Actellic	K 6,000
• Itinerant Trader's profit	K 3,500

- a. Calculate the total marketing cost of itinerant traders level

$$\text{Total marketing Marketing cost} = 10,000 + 6,000 + 6,000 + 3,500 \quad (1)$$

$$=K25, 500 \quad (1)$$

b. Find the price received by the final consumer.

Final price = Farm gate price + marketing price

$$= 300,000 + 25,000 \quad (2)$$

$$= 325,000 \quad (1)$$

c. State any **two** ways in which a farmer can reduce the marketing costs.

- By skipping some marketing agencies
  - By performing some marketing function
- (2 for any 2)

5. a. Give any **two** ways in which soil salinity affect crop production.

- Accumulation of salts in the soil / which affects seed germination.
- It causes plasmolysis / which cause plant death.
- High accumulation of salts in the soil / which interferes with microbial activities such as nitrification, decomposition.

**(2 marks for any two)**

b. Describe any **two** factors that affect the nutrients status of the soil

- Parent material of the soil.
- Leaching of the basic nutrients.
- Soil erosion.
- Crop removal
- Nutrients uptake by the plants.

**(2 marks for any two)**

d. Explain any **one** way of modifying soil pH

- Application of organic fertilizers.
- Application of inorganic fertilizers such as CAN
- Lime application

**(2 marks for any one)**

6. a. Mention any **two** importance of crop processing.

- It add value to produce
- Improves taste of the produce

- Improves shelf life of the produce.
- For easy transportation
- Source of employment
- Improves the quality of the product

(2 marks for any 2)

b. Outline any **four** steps involved in processing mushrooms for storage.

- i. Washing
- ii. Blanching
- iii. Salting
- iv. Drying

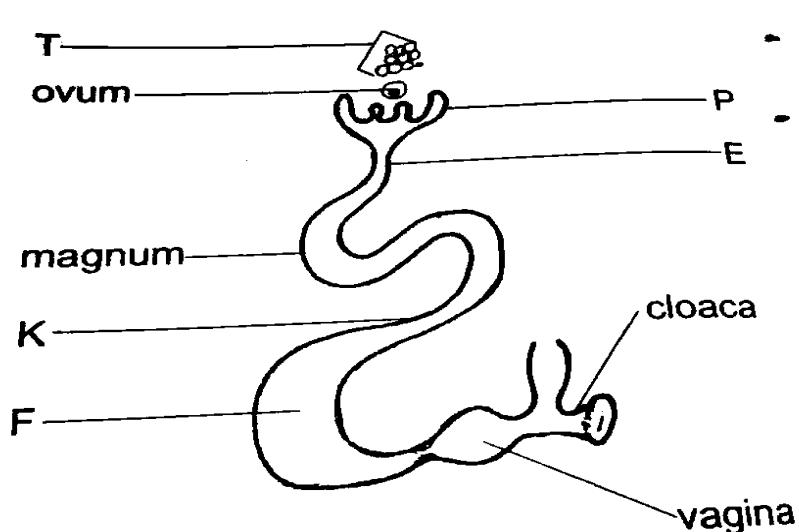
(4 marks for any 2)

c. Mention any **two** roles of agro-based industries in supporting the growing population in Malawi.

- Source of employment
- Provide markets for produce
- Processing raw materials.

(2marks for any 2)

7. a. The **figure below** shows diagram of the oviduct of female chicken. Use it to answer the question that follow.



a. Name the parts labelled **T**, **F** and **P**.

- T : ovary
  - F : shell gland
  - P : funnel / infidubulum
- (2marks for any 2)**

b. State the function of part labelled T and F

- T : for formation of shells
  - F : for egg / ovum production
- (2marks for any 2)**

8. Table 1 shows the results of an experiment on varieties of maize expressed in kg/ha. Use it to answer the question that follow.

Variety	Yield (kg/ha)
P	<b>4318</b>
Q	<b>3269</b>
R	<b>2657</b>
S	<b>1840</b>

a. State the aim of the experiment.

- Identify maize variety with high yield.
  - Check on high yield maize variety.
- (1 mark for any one)**

b. Give any **two** factors that must remain constant in the experiment.

- Size of man/ha
  - Amount of seed used
  - Time of weeding, planting, fertilizer application etc.
  - Type of fertilizer applied
  - Amount of fertilizer applied
- (2 marks for any 2)**

c. Explain any **two** ways in which the experiment can help to ensure food security.

- It would help a farmer to generate new knowledge on the high yielding variety /thereby ensuring food security.
  - It would help the farmer to choose high yielding variety thereby / ensuring food security
- (4 marks)**

9. a. Define the term 'soil degradation'

- it is the loss or decline in the value and quality of the soil **(1 mark)**

b. Describe **one** effect of soil degradation on maize production

- loss of top soil
- spread of waterborne diseases and soil borne diseases
- spread the weed seed
- flooding, silting and pollution of water bodies **(1 mark)**

c. Explain how the following help in controlling soil degradation

i. Grassed water ways

- They lead water / from the farm to the safer grounds.
- Helps reduce the speed of water / therefore reduce soil erosion

ii. Trash lines

- They help trap soil and reduce the speed of run- off water down the slope / which facilitating water infiltration into the soil.

10. a. Give **two** materials that can be used as substrate for mushroom.

- wheat, logs, sawdust, maize stalks, banana fronds, cassava peels, cotton waste, rice flour **(2 marks for two)**

b. State any **two** ways of treating mushroom substrate.

- hot water treatment
- lime water treatment
- solar heating treatment **(2 marks for one)**

c. Explain any **two** factors that a farmer has to consider when harvesting mushroom.

- Maturity of the mushrooms / harvesting is done once caps / button appear
- Marketing/ mushrooms ready for market are divided into three grades depending on size of caps.
- Time of harvest / should be harvested at the correct time to ensure continuous formation of the new ones.

**(4marks for any 2)**

d. Give any **two** examples of crops propagated by the following vegetative planting materials.

**i. Leaf**

- Cactus

**ii. Suckers**

- Banana / pineapple

**(2marks for any 2)**

## **SECTION B: ESSAY QUESTIONS**

11. Explain any **five** ways in which mixed cropping would ensure food security.

- It helps to control pest and diseases / since one crop acts as a barrier.
- It saves land / since the same land is used for more than one crop.
- Its increases soil fertility / if legumes are included.
- It reduces the risk of crop failure / since a farmer depend on other crops if one fail
- High total yield / since the farmer harvest two or more crops.
- There a wide of variety of food stuff / hence the farmer is food secure.
- It provides soil cover / hence reduces soil erosion.

**(10 marks for any 5)**

12. Explain any **five** benefits of Agricultural cooperatives to smallholder farmers.

- Member/ farmers have bargaining power /for better prices
- Members can obtain credit/ help them in their farming activities more easily.
- They eliminate unnecessary profits/ made by middle men
- Easy transportation for their produce to the markets/ since members share cost.
- Members share some overhead cost/ as a result high net income may be realized.
- Make use of expensive machinery/ such as tractors

**(10 marks for any 5)**

13. Low income farmers live in an area with the following characteristics.

- Moderate sloping land with clay soils
- A dam with plenty of water situated on the upper part of the farms
- Plenty of unskilled labour

- Plenty of hoes and axes given from local organisation
- An irrigation expert from Extension Planning Area (EPA)

If the area experiences a long dry spell every year, describe how farmers can establish a suitable irrigation system for maize production.

- Farmers should establish furrow irrigation system (1) / in which water flows to the farms through gravity (1)
- Farmers should use Unskilled labour (1) / in opening up and maintaining the canals (1)
- Farmers should consult an irrigation officer (1) / on the best way to establish an irrigation scheme (1)
- Farmers should use hoes, axes (1) / to construct and maintain canals (1)
- Farmers should use a dam (1) / as a main source of water for irrigation (1)
- Farmers should construct the water channels in clay soils (1) / to reduce infiltration / loss of water through infiltration (1)

#### **END OF FOURTH PAPER**

# Firth paper

1. (a) Define the term “Artificial insemination”
  - This is the artificial introduction of sperms into the reproductive tract of a female animal. **(1 mark)**
- (b) Give any two factors that limit the use of artificial insemination by smallholder farmers.
  - It is expensive to set up and maintain Artificial insemination (AI) program.
  - Timing for AI administration maybe problem since it is difficult to detect whether the animal is on heat or not.
  - It requires trained personnel and special equipment which may not be available in time.
  - Does not achieve 100% results.
  - Due to logistic problems, the cow may not be served in time.

**(c marks for any two)**

- (c). list any two characteristics of plant elements
  - It should be involved in metabolic processes
  - Its deficiency should be corrected by application of a correct element
  - If the soil is lacking, the plant should show the deficiency symptom.

**(2 marks for any two)**

- (d). list any two importance of soil microorganisms.
  - Helps in nitrogen fixation
  - Helps in improving soil aeration
  - Help in decomposing dead plants and animal matter

**(2 marks for any two)**

2. (a) Give two breeds of goats raised for milk production.
  - i. Tobberg
  - ii. British Alpine
  - iii. Saanan

**(2 marks for any two)**

(b) One morning a farmer based in Machinjiri observed the following on his goat.

- Pus on the feet and bad smell
- Swelling of feet and difficult in walking
- Animal become lame
- i. Identify the disease
  - Foot rot disease

**(1 mark)**

ii. Suggest any one control measure or treatment for the disease mentioned above.

- Avoid grazing the animals in damp, muddy, or marshy land
- Provide animals with foot bath of 3% formalin or any appropriate chemicals.
- Treat the animal feet with antibiotics.

**(1 mark for any one)**

(c) A farmer wants to grow mangoes on his land. Give two factors that should be considered for high income value.

- **Should be planted in deep well drained sandy soils**
- **Planted in within the temperature conditions of between 24-28 degree celcius**
- **Altitude should be 600m**
- **Minimum rainfall amount received should be 650 mm per annum (2 mark)**

3. (a) Briefly describe the following sources of power on the farm.

i. Biomass

- The energy produced from animal dumps

**(1 mark)**

ii. Solar

- This is the types of energy which is obtained from sunlight

**(1 mark)**

(b) Give any one important of solar power on the farm.

- This is the types of energy which is obtained from sunlight **(1 mark)**

(c) A soil test of Mrs Phiri shows that it needs 42kg of phosphorus per hectare for optimum maize production. She intends to use 23:21:0 + 4s as a source of phosphorus.

i. If there are five hectares of land, calculate the amount of fertilizer required in kg.

1 hectare = 45kg

5 hectares = more?

5 hectares X 42 kg

1 hectare

210kg answer

**(2 marks)**

ii. If a 50kg bag of 23:21:0 + 4s costs K19, 500.00 calculate the amount of money required to buy the fertilizer.

50kg = Mk19, 500

210kg = More ?

MK19,500 X210 kg

50kg

MK81900.00 ans

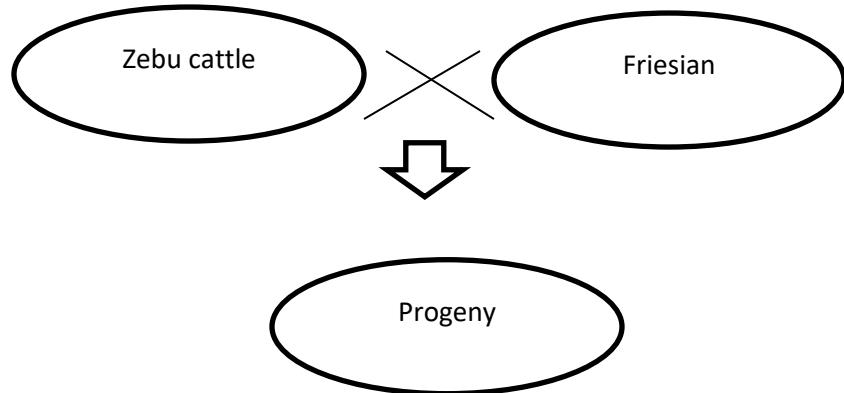
**(2 marks)**

(b) Describe how soil texture is analyzed using the thumb feeling test.

- Collect finely ground soil sample
- Place the soil sample between the thumb and fore finger
- Observe and record the results

**(3 marks for all three stages)**

4. . Figure summaries a method used in livestock improvement. Study the figure carefully and answer questions that follow.



- i. What type of breeding system is shown by the figure above?
    - Cross breeding **(1 mark)**
  - ii. Give any two advantages of this breeding system in livestock production.
    - Helps to introduce new blood in the herd
    - Helps to improve the productivity of new offsprings
    - Helps to improve the quality of the products.
5. (a) Describe any two harmful effects of plant diseases.
- Injuring roots
  - Leaf diseases interferes with photosynthesis
  - Damage of a plant stalk interferes with food movement with the plant.
  - Diseases lower the quality of crop products.
  - Diseases lower the quantity of crop harvest.
- (2 marks any two)**

(b) Give two precautionary measures that farmers should observe when:

- i. Doing physical method of controlling weeds
  - Uprooting weeds before flowering stage
  - uprooting weeds before its roots intervenes with crop plant roots

- The uprooted weeds are affectively disposal off.

**(2 marks for any two)**

ii. Processing silage

- The cut silage should be dried to a moisture content of about 65%
- Cut the forage before flowering
- Forage is the side should firmly completed

**(2 marks for any two)**

(c) Explain any two ways how soil pH influences crop growth and development.

- Affects microbial activity rate, microbial becomes less active when the soil is too acidic.
- Affect availability of nutrients elements such as Zinc, Fe, Mn, Cu become less available which the PH level is above 5.5
- Affect crop performances as some prefer acidic soil while some alkaline soil crops such as tea and pine apple prefer acidic soils

**(2 marks for any two)**

6. (a) State any two points to consider when setting up flood irrigation system?

- **The land should have a gentle slope**
- **Should have plenty water source**
- **Suitable in heavy soils (clay soils)**

**(2 marks)**

(b) Describe ‘surface land drainage’

- Make drains under the soil
- This is a type of drainage system used to remove excess water from the land surface using open ditches/pumping/cambered bed.

**(2 marks)**

7. (a) i. in what unit is labor measured on a farm?

- Man days, man weeks, man months, man years **(1 mark)**

ii. Explain any one important characteristic of labor that makes it different from other factors of production.

- It is an intelligent resource which can organize and use other factors of production for maximum production. **(2 marks)**

(b) Mr Kamphonje has been growing maize in his garden for a long time. He now wants to grow the maize together with groundnuts in that same garden. Because of this change, Mr Kamphonje will have to prepare for the following changes:

- To buy 4 kg of maize seed instead of 5 kg at K2000.00 per kilogram
  - To buy 3 kg of groundnut seed at K3000.00 per kilogram
  - To sell 40 bags of maize instead of 50 bags at K8000.00 per bag
  - To sell 10 bags of groundnuts at K15000.00 per bag
- i. Prepare a partial budget for Mr Kamphonje.

<b>Income</b>	<b>Amount (MK)</b>	<b>Expenditure</b>	<b>Amount (MK)</b>
<b>Added Income</b>		<b>Added Costs</b>	
40 bags of maize @ K8000/bag	320000	4 kg of maize seed @ K2000/kg	8000
10 bags of groundnuts @ K15000/bag	150000	3 kg of groundnut seed @ K3000/kg	9000
<b>Saved Costs</b>		<b>Reduced income</b>	
5 kg of maize seed @ K2000/kg	10000	50 bags of maize @ K8000/bag	400000
<b>Sub Total</b>	<b>480000</b>	<b>Sub Total</b>	<b>417000</b>
<b>Loss</b>		<b>Profit</b>	<b>63000</b>
<b>Total</b>	<b>480000</b>	<b>Total</b>	<b>480000</b>

(8 marks)

- ii. Should Mr Kamphonje proceed with the change that he wants to make?

- Yes he should proceed (1 mark)

Reason to your answer

- The business will bring profit to the farmer (1 mark)

(c) i. Describe any two inventory records that may be kept by a Dairy farmer.

- **Feed trough records**
- **Water trough records**
- **Milking buckets**
- **Number of feeding stall**

**(2 marks)**

8. Farmers in a certain village had the following services at their disposal

- Seed technology
- Agricultural credit societies
- Food and nutrition units
- Irrigation technology

a. Describe how the farmers can use these resources and services to maximize production.

- Seed technology enables farmers to have improved seed varieties that give high yield
- Agricultural credit societies provide loans to farmers that be used to boost the farmers agricultural business.
- Use of irrigation technology helps farmers to plant and harvest twice in a year.

**(4 marks for any two)**

b. Explain two impacts of HIV/AIDS on agricultural development.

- Weakening the labor work force
- Taking time away from farming
- Killing the most productive in population
- Depleting from capitals
- Disturbing the emotional balance of the farmers

**(2 marks for any two)**

9. The table below was recorded after conducting a field experiment. Study it and answer the questions that follow

Maize Hybrid	Total yield in Ton/hectare	
	Early planting	Late planting
A	20.5	16.0
B	18.3	16.5
C	25.9	10.6
D	14.2	13.4
E	19.0	14.3

(a) i. What was the aim of the experiment

- To find the effect of planting time on crop yield quantity. **(1 mark)**

iii. Give two variables which were held constant in the experiment.

- Maize variety
- Land size
- Type of fertilizer applied.
- Fertilizer application rate
- Weeding method.
- Pest and disease control method **(2 marks)**

(b) i. What conclusion can you draw from this experiment using the data given in the table?

- Planting time has the direct impact on crop production. Early planting had to high yield quantity while late planting lead to low yield quantity. **(2 marks)**

iii. Suggest any two materials that were used in this experiment.

- Beam balance
- Land
- Seeds
- Hoes/pangas
- Fertilizer
- Herbicides

- pesticides
  - Sacks for harvesting
- (2 marks)**

(c) Justify the reliability of these results assuming you want to write a report.

- The experiment was done several times in order to minimize the environmental interferences which could have affected results for the experiment.

**(2 marks)**

## **SECTION B**

**Answer all questions in this section.**

10. Explain five ways how rapid population growth accelerates soil erosion.

- The need for more animal products forces people to keep more animals on small piece of land. This result into bare land hence exposing it to erosion.
- The demand for forest products and land for farming causes deforestation this leaves the land bare hence soil erosion.
- The demand for forest products and land for settlement causes deforestation this leaves the land bare hence soil erosion
- The need for more land for cultivation causes people cultivates marginal land. This speed up soil erosion.
- The need to produce more food causes people to practice continuous cultivation. This destroys soil structure hence causing soil erosion.

**(10 marks for five points and the explanation)**

**END OF FIRST PAPER**

# **Sixth Paper:**

**Instruction: it's your paper, answer all the questions using spaces provided.**

## **SECTION A: (70 Marks)**

1. a. Define the term rogueing off as used in pasture production

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(2 marks)

- b. Explain two reasons why zero grazing is not suitable for the small holder farmers.

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(4marks)

2. Table 1 shows Mango yield in three fields with different pH values. Use it to answer questions 2a and b

Field	A	B	C
pH value	3.0	7.5	13
Number of mangoes	200	700	400

- a. i. Describe the relationship between pH value and mango yield in the fields.

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(2 marks)

- ii. Explain one way in which the relationship described in 2a(i) is important in Mango production.

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(2 marks)

b. Give any two ways of modifying pH of soil.

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(2 marks)

3. a. Define gender bias in agriculture?

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(1 mark)

b .i. State any two factors to consider when choosing an enterprise combination

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(2 marks)

ii. Describe any two ways in which farmers can adjust to risks and uncertainties.

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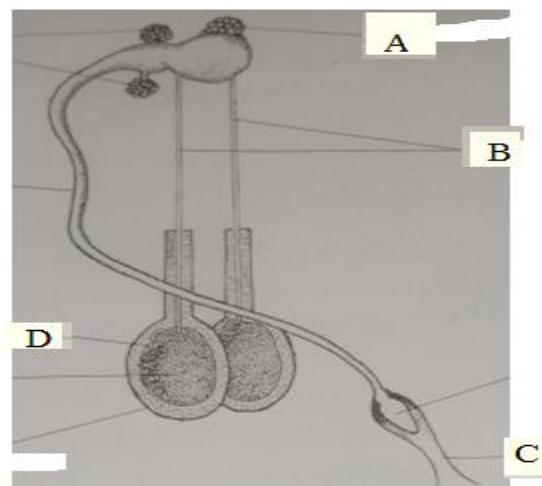
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(4 marks)

4. **Figure 1** below is a diagram that shows the reproductive organ of a bull, study it and answers questions 4a and 4b.



a. Identify parts labeled A, B and C

A: \_\_\_\_\_

B: \_\_\_\_\_

C: \_\_\_\_\_

(3 marks)

b. State the function of part D.

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(1mark)

c. Explain why good understanding of the reproductive processes is important in livestock production

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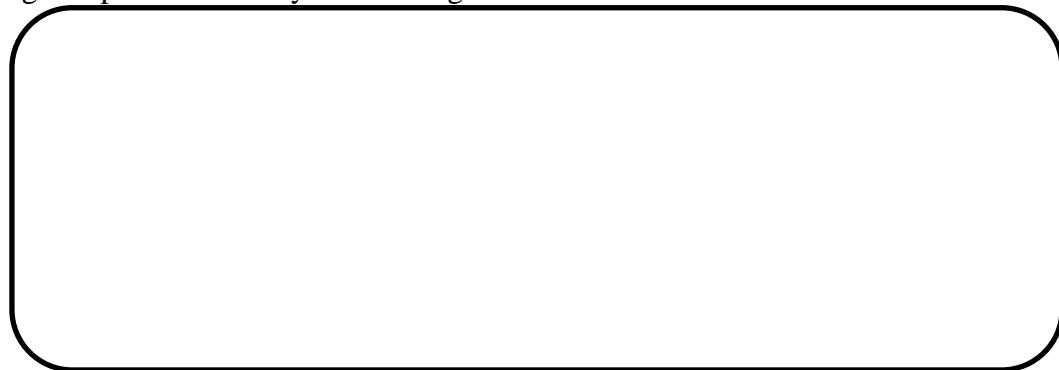
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(2 marks)

5. Mr. Bwerani established a legume pasture using the following

- Seed size : 300 000/kg
- Purity percentage : 90%
- Germination percentage : 75%

a. If the farmer expects to have 900000 plants per hectare, calculate seed rate of the legume pasture. Show your working.



(4marks)

b. Give any two factors that affect seed rate of pasture.

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(2 marks)

6. An experiment was carried out on maize garden. Table 2 below shows the results.

Depth of planting holes	Yield (kg/50m <sup>2</sup> )
5cm	300
8cm	400
11cm	200

a. i. Identify any two treatments in the research

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(2 marks)

ii. Mention any two factors that were kept constant in the research

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(2marks)

b. What is the aim of the experiment?

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(1mark)

c. Describe any one design, the researchers can use for the experiment.

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(2 marks)

7. a. Discuss any one way in which each of the following animal husbandry practices are important in livestock production.

- i. Clipping of teeth in pig production.

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(2 marks)

- ii. Disbudding in calves

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(2 marks)

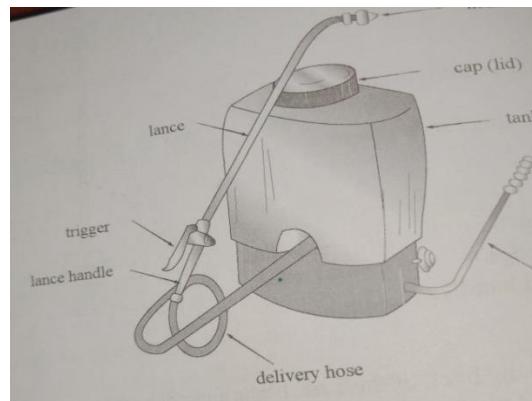
- b. Mention two minerals responsible for the growth of bones in broilers.

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(2marks)

8. Figure 2 below shows a diagram of farm equipment. Use it to answer questions **8a** and **b**.



- a. i. Name the farm equipment

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(1mark)

ii. Explain how the equipment in 8 (i) is important in mushroom production.

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(2 marks)

b. State any one safety measure that should be observed when using the equipment 8a(i)

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(1mark)

9. a. Give any two roles of wholesalers as marketing agencies.

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(2 marks)

b. Describe how population can affect the demand of beef at the market.

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(2 marks)

c. State three factors that affect food security in your area.

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(3 marks)

10. a. Explain any two ways how soil pH affects nutrient status of the soil.

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(4 marks)

b. i. Give any two causes of soil degradation.

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(2 marks)

ii. Outline any one factor that affect soil depth

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(2 marks)

a. List down any two examples of exotic Mangoes

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(2 marks)

11. Figure 3 shows a crop pest. Study it and answer the questions that follow.



a. i. Identify the pest

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(1mark)

ii. Mention any two crops attacked by the pest in 11a(i)

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(2 marks)

b. Explain any one way in which the pest reduces the crop in 2a(ii)

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(2 marks)

c. Describe any one way how the pest can be controlled.

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(2 marks)

### **SECTION B: (30 MARKS)**

**Answer all questions**

10. Discuss any five factors to consider when selecting goats for breeding.

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(10 marks)

11. Describe any five husbandry practices for mushroom production.

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(10 marks)

*End of question paper*

**Wishing you all the best as you continue preparing for MSCE Examinations**