

## AGRICULTURE PAPER 1

### SECTION A (30 marks)

1. Disadvantages of intensive system of farming.
  - i) Requires high initial capital/Expensive
  - ii) Is labour expensive
  - iii) Requires high level of management/skilled labour (2 x 1/2 = 1 mark)
2. 4 methods of farming.
  - i) Shifting cultivation
  - ii) Nomadic pastoralism
  - iii) Organic farming
  - iv) Mixed farming
  - v) Agroforestry (4 x 1/2 = 2 marks)
3. a) Nitrogen fixation  
- Process in which atmospheric nitrogen is converted to nitrates for plant uptake. (1 x 1 = 1 mark)  
  
b) Phosphorous fixation  
- Process in which phosphorous combines with other elements to form compounds that cannot be absorbed by plants. (1 x 1 = 1 mark)
4. 4 reasons for keeping livestock health records.
  - i) Help in calculation of treatment and health costs
  - ii) Help in culling/selecting livestock
  - iii) Help in future diagnosis treatment and control measures
  - iv) Help determine the common diseases and parasites/prevent diseases and parasites
  - v) Help to support livestock insurance claims (4 x 1/2 = 2 marks)
5. Relationship between scarcity and choice.  
- Scarcity is where production resources are limited in supply relative to demand; therefore a choice has to be made on which enterprise(s) to allocate the limited resources. (2 marks - mark as a whole)
6. 2 reasons for land fragmentation.
  - i) Buying/selling/paying debts/compensation
  - ii) Inheritance
  - iii) Settlement and resettlement
  - iv) Gift/donations
  - v) Shifting cultivation (2 x 1/2 = 2 marks)
7. Advantages of individual tenure system.
  - i) Easy to acquire credit.
  - ii) Land disputes are minimized
  - iii) Long term investment is encouraged
  - iv) Incentive to conserve and improve land
  - v) Easy to plan and make decisions
  - vi) Easy to sell/lease whole or part of the land. (4 x 1/2 = 2 marks)
8. 4 features for choosing powers
  - i) Durability
  - ii) Strength/ability to withstand pressure/thickness of the wall of the pipe
  - iii) Diameter/size of the pipe
  - iv) Workability/manoeverability of the pipe
  - v) Colour (4 x 1/2 = 2 marks)
9. 4 reasons for treating water.



- i) Remove chemical impurities/softening of water
- ii) Kill disease causing organisms/kill germs/pathogens
- iii) Remove bad smells and taste
- iv) Remove impurities of solid particles (4 x  $\frac{1}{2}$  = 2 marks)

10. 4 Statutory Boards

- i) Kenya Sugar Board/Authority (KSB/KSA)
- ii) Kenya Tea Development Authority/Agency/Tea board of Kenya (KTDA, TBK)
- iii) National Cereals and Produce Board (NCPB)
- iv) Coffee Board of Kenya (CBK)
- v) Pyrethrum Board of Kenya (PBK)
- vi) Cotton Lint and Seed Marketing Board/Cotton Board of Kenya (CLSMB, CBK)
- vii) Horticultural Crop Development Authority (HCDA)
- viii) Kenya Sisal Board (KSB) (4 x  $\frac{1}{2}$  = 2 marks)

11. 4 marketing functions of KCC

- i) Buying and assembling milk/collection
- ii) Processing milk
- iii) Market research
- iv) Advertisement/promotion of milk/milk products
- v) Strategic storage of milk products
- vi) Distribution of milk/transportation
- vii) Selling milk
- viii) Marketing and packaging
- ix) Risk bearing
- x) Financing - related to marketing function
- xi) Grading/standardization

Rej: Marketing alone (4 x  $\frac{1}{2}$  = 2 marks)

12.

- i) Increases seed soil contact
- ii) Compacts soil/seed to protect it against agents of erosion
- iii) Crushing large soil clods
- iv) Soil levelling (2 x  $\frac{1}{2}$  = 2 marks)

b) Levelling

- i) Ensures uniform depth of planting/uniform germination/uniform fertilizer application
- ii) Ensures uniform water level in paddy
- iii) Rice fields
- iv) To remove depression which collect water leading to rotting of seeds. (2 x  $\frac{1}{2}$  = 1 mark)

13. 3 activities in clearing land

- i) Tree felling
- ii) Stumping/removal of stumps/destumping
- iii) Slashing/mowing (3 x  $\frac{1}{2}$  = 1 $\frac{1}{2}$  marks)

14. 5 Advantages of zero grazing

- i) Requires little land
- ii) Quick accumulation of manure
- iii) Easy to control diseases and parasites
- iv) Less wastage of feeds
- v) Has high stocking rate
- vi) High milk yield
- vii) Efficient use of fodder (5 x  $\frac{1}{2}$  = 2 $\frac{1}{2}$  marks)



15. 4 factors determining stage of crop harvesting.
- i) Intended use of the crop
  - ii) Chemical concentration of the produce/stage of maturity/change in colour
  - iii) Prevailing weather conditions
  - iv) Market demand for the produce/market price ( $4 \times \frac{1}{2} = 2$  marks)
16. a) Growth Cycle
- i) Annual weeds
  - ii) Biennial weeds
  - iii) Perennial weeds ( $2 \times \frac{1}{2} = 1$  mark)
- b)
- i) Broad leaved weeds
  - ii) Narrow leaved weeds ( $2 \times \frac{1}{2} = 1$  mark)

**SECTION B (20 marks)**

17. a) Weed
- Couch grass/*Digitaria scalarum* ( $1 \times \frac{1}{2} = \frac{1}{2}$  mark)
- b) Why its difficult to control.
- Presence of underground stems/rhizomes which are difficult to control/underground storage structure ( $1 \times 1 = 1$  mark)
- c) 4 control
- i) Uprooting
  - ii) Cultivation
  - iii) Slashing
  - iv) Use of herbicides
  - v) Mulching
- Rej: Rogueing ( $4 \times \frac{1}{2} = 2$  marks)
18. a) Soil Sample with highest acidity
- Sample S1 ( $1 \times \frac{1}{2} = \frac{1}{2}$  mark)
- b) Lowering pH
- i) Application of acidic fertilizers: Accept S/A; ASN; DAP; MAP
- Rej: Nitrogenous fertilizers
- ii) Application of sulphur ( $2 \times \frac{1}{2} = 1$  mark)
- c) Soil sample suitable for tea growing
- i) S<sub>2</sub>
  - ii) S<sub>3</sub>
  - iii) S<sub>4</sub>
- 19.
- i) Extraction to remove seeds from pods/fruits
  - ii) Drying to reduce seed moisture content
  - iii) Testing to verify seed quality
  - iv) Treatment to break dormancy/helps improve germination/soaking in water
  - v) Seed dressing to control pests and diseases
  - vi) Seed inoculation to improve nitrogen fixation
  - vii) Washing/cleaning to remove mucilage ( $4 \times 1 = 4$  marks)
- No procedure



20. a) i) Correct pruning

- B

NB: Wrong identity

Wrong reason

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

ii) Reason

- Slant cut is a few centimetres above the bud/leaf (1 x 1 = 1 mark)

b) 2 how pruning controls diseases

i) Removes diseased parts

ii) Creates unfavourable conditions/environment for disease agents

iii) Facilitates penetration of chemical sprays. (2 x  $\frac{1}{2}$  = 1 marks)

21. KABURU FARM CASH ANALYSIS FOR JANUARY 2009 • No marks for title

RECEIPTS (SALES AND RECEIPTS) EXPENDITURE(PURCHASES AND EXPENSES)

| Date    | Description                   | Total   | Cash   | Livestock | Crop   | Date    | Description                         | Total   | Crops  | Livestock |
|---------|-------------------------------|---------|--------|-----------|--------|---------|-------------------------------------|---------|--------|-----------|
|         | Ksh                           | Ksh     | Ksh    | Ksh       |        |         | Ksh                                 | Ksh     |        |           |
| 01/1/09 | Cash in hand                  | 30,000  | 30,000 |           |        | 15/1/09 | Seeds for planting                  | 7,500   | 7,500  |           |
| 05/1/09 | Livestock sales               | 80,000  |        | 80,000    |        | 20/1/09 | Paid KFA for fertilizer             | 16,400  | 16,400 |           |
| 08/1/09 | Crop sales                    | 50,000  |        | 50,000    |        | 25/1/09 | Bought livestock feed               | 50,000  |        | 50,000    |
| 31/1/09 | Cash for milk delivery to KCC | 120,000 |        | 120,000   |        | 30/1/09 | Paid wages for planting & weeding   | 56,000  | 56,000 |           |
|         |                               |         |        |           |        | 31/1/09 | Transport charges for milk delivery | 9,000   |        | 9,000     |
|         | TOTAL                         | 280,000 | 30,000 | 200,000   | 50,000 |         | TOTAL                               | 138,900 | 79,900 | 59,000    |
|         |                               |         |        |           |        |         | Closing balance/ cash at hand       | 141,000 |        |           |
|         | TOTAL                         | 280,000 |        |           |        |         | TOTAL                               | 280,000 |        |           |

NB: Check for double entry

21. • Correct labelling of expenditure and receipt columns 1 x  $\frac{1}{2}$  =  $\frac{1}{2}$  mark

• Correct entries by dates 9 x  $\frac{1}{2}$  = 4 $\frac{1}{2}$  marks

• Balancing 1 x  $\frac{1}{2}$  =  $\frac{1}{2}$  mark

Closing balance

Cash at hand i.e 141,000

22. a) Figures 18:46 on a fertilizer bag mean

i) 18% Nitrogen (NO)

ii) 46% phosphorous pentoxide (P<sub>2</sub>O<sub>5</sub>)

iii) 10% Potassium oxide (K<sub>2</sub>O) (3 x  $\frac{1}{2}$  = 1 $\frac{1}{2}$  marks)

b) Filler material

= 100 - (18 + 46 + 10)

= 100 - 74

= 26kg or 26%

Ignore working

Mark answer only i.e 26

Unit must be therefore a score. 1 x 1 = 1 mark



**SECTION C (40 marks)**

23. a) 8 Factors that encourage soil erosion.

- i) Lack of ground cover exposes soil to agents of soil erosion/removal of cover crops
- ii) Steep slopes increase the speed of surface run-offs hence erosive power of water
- iii) Light/sandy soils are easily carried away by agents of soil erosion.
- iv) Shallow soils are easily saturated with water and carried away
- v) High rainfall intensity on bare ground/leads at detachment of soil hence run off
- vi) Frequent cultivation/over cultivation pulverizes the soil making it easy to detach and carry away.
- vii) Overstocking leads to overgrazing which destroys ground cover exposing it to agents of erosion.
- viii) Burning/deforestation destroys vegetation cover and exposes soil to agents of erosion.
- ix) Ploughing up and down the slope creates channels which speed up and increases the erosive it to agents of water.
- x) Cultivation of river banks destroys riverine (Viparia) vegetation & destroys soil structure exposing it to agents of erosion.
- xi) Cultivating the soil when too dry destroys soil structure making it easy to be eroded.
- xii) Long slopes increases volume speed of run off hence increasing erosive power of water.

Question if filter not qualified = No mark

Factor & effect

- xiii) High rainfall amount increase saturation of soil hence increase in soil erosion.

b) i) Mulching to conserve moisture

ii) Erection of shade to minimize evapotranspiration

iii) Weed control to reduce competition with seedlings for nutrients, light, space etc

iv) Pest and disease control to ensure healthy and vigorously growing seedlings

v) Pricking out/thinning to minimise competition for growth elements

vi) Fertilizer application to supplement nutrients in the soil

vii) Watering to ensure adequate moisture supply

viii) Hardening off/removing shade/reducing watering to acclimatize the seedling to conditions in the field.

ix) Removal of mulch immediately after germination

NB: Correctly stated (7 x 1 = 7 marks)

c) 5 soils factors that determine a crop growth in an area.

i) Soil drainage/rate of water infiltration and percolation through the soil

ii) Soil structure/arrangement of soil particles or aggregates/water holding capacity

iii) Soil nutrient content/variety and quantity of mineral nutrients in the soil/Soil fertility

iv) Soil profile/soil depth/depth and arrangement of soil horizons in relation to the rooting systems of the crop

v) Soil pH/chemical properties of the soil/degree of acidity or alkalinity of the soil solution

vi) Soil borne pests and diseases/the prevalent pests/diseases in the soil

vii) Water holding capacity

5 correctly stated (5 x 1 = 5 marks)

24. a) 5 effects of high temperature

i) Increases incidences of some pests/parasite and diseases

ii) Improves quality of certain crops e.g fruits, pineapples, papaws'

iii)Lowers quality of certain crops e.g pyrethrum

iv) Increases rate of evapotranspiration/wilting in plants

v) Increases rate of growth for early maturity in crops

vi) Limits distribution of exotic livestock breeds

vii) Lowers production in livestock

viii) Influences design of farm buildings and structures

ix) Lowers labour productivity (5 x 1 = 5 marks)





b) 4 precautions observed in cotton harvesting

- i) Sisal bags/gunny bags should not be used to prevent mixing of lint and sisal fibres which causes ginning problems
- ii) Hands should be cleaned to avoid staining of the lint
- iii) Picking should be done when the lint is dry to prevent fibres from sticking together
- iv) Use clean containers for picking
- v) Use different containers for AR (Safi) and BR (fifi) gardens of cotton to ensure quality/separation
- vi) Picking should be done immediately the bolls open/split to prevent staining by dust/dirt
- vii) Avoid picking leaves & twigs to avoid (containers)

1 x 4 = 4 marks

b) Sugar cane harvesting

- i) Harvest at the correct age / 13 -22 months for plant crop/ 12 - 18 months for rotation
- ii) Take sugar cane samples for testing to determine maturity.
- iii) Cut the mature cane at the base/near the ground
- iv) Cut off the green tops
- v) Strip off green leaves/burn the cane
- vi) Deliver the cane to the factory within 48 hours/immediately after cutting
- vii) Use a cane harvesting machete. (6 x 1/2 = 3 marks)

c) 8 factors considered in farm planning

- i) Risk and uncertainties: enterprises should be analysed to determine the risks and uncertainties involved.
- ii) Security: enterprises which require more security should be sited near the farm house/provision of adequate security
- iii) Land size: a large number of enterprises can be established on a large scale compared to a small scale farm.
- iv) Current trends in labour market: to determine availability and cost of labour especially during peak period.
- v) Farmers objectives and preferences: to ensure the farmer who is the operator has a sense of ownership of the plan and brings about motivation
- vi) Current market trends and prices of outputs: to ensure consideration of enterprises with high profits returns.
- vii) Availability and cost of farm inputs: to identify enterprises that are affordable and whose inputs are readily available.
- viii) Government policy/regulation: to seek permission for enterprises undertaken on quota system e.g coffee growing and avoid enterprises and farming systems prohibited by the government
- ix) Environmental factors: soil, climate and topography should be analysed to determine livestock crop enterprises that are suitable to the local ecological conditions.
- x) Communication and transport facilities and facilitate movement of outputs to the market and supply of inputs. Also helps in conveying improved methods of farming and market trends.
- xi) Availability of capital: to acquire farm inputs
- xii) Possible production enterprises: should be identified and analysed so that suitable and profitable enterprises are selected

- Wrong factor

Award for explanation

1/2 mk - stating the factor =  $1/2 \times 8 = 4$

25. a) 6 physical methods of controlling crops pests

- i) Trapping/picking and killing the pests
- ii) Use of lethal temperature to kill the pests
- iii) Flood the suffocate and kill the pests
- iv) Use of physical barriers e.g fences, rat guards, etc to keep the pests away from the crop/produce
- v) Proper drying to make penetration difficult



vi) Use of explosive to destroy breeding grounds and the kill the pests

vii) Suffocation: carbon dioxide build up to suffocate pests in stores especially cyprus bins. (6 x 1 = 6 marks)

b) Field management of bulb onions

i) Weed control through shallow cultivation to avoid damage to the shallow onion roots

ii) Remove excess soil around the roots gradually to facilitate bulb expansion

iii) Water regularly at the early stages to ensure adequate moisture supply

iv) Top dress with nitrogenous fertilizer at appropriate rates

v) Control pests e.g thrips using appropriate pesticides

vi) Control diseases e.g rusts, mildews using appropriate method. (4 x 1 = 4 marks)

ii) Harvesting of bulb onions

i) Is done 4 -5 months after planting/when leaves wither/turn brown

ii) Cut break and bend this tops at the neck

iii) Harvesting is done by lifting/pulling/digging out the crop

iv) Leave the bulbs on the ground/undershade to dry for 3 days and turn frequently to ensure uniform drying.

3 x 1 = 3 marks

c) 7 factors influencing seed rate

i) Intended use of the crop e.g fodder maize requires high seed rate than grain maize.

ii) Germination percentage - high seed rate is required for seeds with low germination percentage

iii) Method of planting: Broadcasting requires high seed rate than row planting.

iv) Number of seeds per hole: two or more seeds per hole requires more seed rate than one seed per hole.

v) Soil fertility: poor/infertile soils require low seed rate because crops are widely spread compared to fertile soils.

vi) Growth characteristics of the crop: tall/tillering/indeterminate varieties require low seed rate compared to short/less tillering/determinate varieties

vii) Spacing: High seed rate is required in closer spacing than wider spacing

viii) Seed purity: Impure seed/containing chaff and foreign materials will lead to high seed rate compared to pure seed

ix) Pure/mixed stand

High seed rate for pure stand and low seed rate for mixed stand.

$\frac{1}{2}$  mk for stated factor =  $\frac{1}{2} \times 7 = 3\frac{1}{2}$  mk

$\frac{1}{2}$  mk for explanation given =  $\frac{1}{2} \times 7 = 3\frac{1}{2}$  mk



**AGRICULTURE PAPER 2**

**SECTION A (30 marks)**

1. Causal agent of anaplasmosis disease in cattle
  - Protozoa/anaplasma marginate/anaplasma spp. (1 x 1/2 = 1/2 mark)
2. Materials used in constructing a Kenya Top Bar Hive (K.T.B.H)
  - Timber
  - Nails
  - Plain wire
  - Iron sheets (4 x 1/2 = 2 marks)
3. a) Breeds of dairy cattle that originated from the channel islands:
  - Guernsey
  - Jersey (2 x 1/2 = 1 mark)

b) i) Chinchilla rabbit

  - Grey/silvery (1 x 1/2 = 1/2 mark)

ii) Toggenburg

  - Brown with two white stripes running down the face (1 x 1/2 = 1/2 mark)
4. Reasons for castration
  - Prevent uncontrolled mating/breeding
  - Improve the quality of meat
  - Promote faster growth/facilitate weigh gain
  - Make then docile
  - Control breeding diseases
  - Control inbreeding (4 x 1/2 = 2 marks)
5. Characteristics of roughages
  - Bulky
  - High fibre content
  - Low nutrient content
  - Low digestibility
  - Mainly of plant origin (4 x 1/2 = 2 marks)
6. Functions of the poultry digestive system.
  - Softening/moistening food
  - Temporary food storage (2 x 1/2 = 1 mark)
7. Roles of worker bees kills.
  - Kills the drones after mating the queen
  - Scouting for a new home
  - collect nectar/water/gum/propolis/pollen
  - Make honey combs
  - Protect the colony
  - Clean the hive
  - Make honey and bees wax
  - Seal the stacks and services (4 x 1/2 = 2 marks)
8. Reasons for controlling livestock diseases.
  - Reduces spread of livestock diseases/production of healthy young ones
  - Promote fast growth and early maturity - rej to maintain good health in livestock



- Make them have long productive life.

- Improve quality and safety of products
- Improve quantity of products
- Reduce cost of production. (4 x 1/2 = 2 marks)

9. Control measures of fowl pox diseases in poultry.

- Observe hygiene in poultry house
- Regular vaccination
- Slaughter and properly dispose carcass of affected birds - rej culling, killing atone (2 x 1/2 = 1mark)

10. a) shovel

- Mixing mortar/manure
- Lifting soil/manure (1 x 1/2 = 1/2 mark)

b) Strip cup

- To detect mastitis infection in milk. (1 x 1/2 = 1/2 mark)

11. Reasons for maintenance practices.

- For safety of the user/operator
- Ensure efficiency of operations
- Increases durability
- Reduces costs on repairs and replacements
- Avoid damage to the mower. (3 x 1/2 = 11/2 marks)

12. Limitations of using solar power

- Solar trapping devices are expensive
- Power supply/trapping fluctuates depending on weather conditions
- Solar trapping is limited to day light
- Requires skilled labour to handle the devices (3 x 1/2 = 11/2 mark)

13. Importance of thermostat

- Prevents engine from over-heating
- Maintains optimum engine temperature during operation (1 x 1 = 1 mark)

14. Advantages of disc plough over a mould board plough

- Discs roll over obstacles
- Requires less draught power
- Requires less maintenance costs
- Works better on dry, hard and sticky soils (2 x 1/2 = 1mark)

15. Tools used when laying concrete blocks during construction of a wall.

- Plumb bob/plumb line
- Mason's trowel
- Spirit level/pipe level
- Wood float/steel float
- Masons square
- String/masons line/line (4 x 1/2 = 2 marks)

16. Importance of guard rails in a farrowing pen.

- Prevents sow from crushing piglets rej. trampling of piglets
- Prevents sow from eating creep feeds (1 x 1 = 1 mark)

17. Reasons for having foot bath in a cattle dip.

- Clean the feet of animals
- Control foot rot (2 x 1/2 = 1 mark)



18. a) Crutching and ringing
- Crutching is the cutting of wool around the external reproductive organs of a female sheep to facilitate mating
  - Ringing is the cutting of wool around the sheath of the penis in rams to facilitate mating. (Mark as a whole 2 marks)
- b) Cropping and harvesting
- Cropping is the selective removal of fish of marketable size from the pond.
  - Harvesting is the removal of all the fish from the pond. (Mark as a whole 2 marks)
19. Ways in which infectious diseases can spread
- through vectors
  - through ingestion of contaminated food and water/through food and water
  - Through contact
  - Through inhalation of contaminated air/through air. (3 x 1/2 = 1 1/2 marks)

## **SECTION B (20 marks)**

20. a) Causes of chicks' behaviour in the illustrations A, B and C
- A Presence of draught makes the chicks to crowd on one side of the brooder
  - B Cold/inadequate heat makes the chicks to crowd around the heat source
  - C High/Excess heat makes the chicks to move away from the heat source (3 x 1 = 3 marks)
- b) Reasons for making brooder wall round in shape
- To discourage overcrowding of chicks at the corners to avoid suffocation. (1 x 1 = 1 mark)
21. a) F - Cervix
- H - Oviduct/Fallopian tube (2 x 1/2 = 1 mark)
- b) Presence of part labelled G
- Produces ova/female gametes
  - Products hormones that control ovulation cycle/estrogen cycle 2 x 1 = 2 marks
- c) Role of J
- Allows implantation of the zygote and development of the foetus.
  - Contracts to expel foetus
  - Implantation of the foetus (1 x 1 = 1 mark)
22. a) K - Beef tapeworm/Taenia saginata/Taenia spp rej tapeworm
- L - Roundworm/Ascaris lumbricodes/Ascaris spp (2 x 1/2 = 1 mark)
- b) Bladder worm/Embryo Cyst/Cystococcus cellulase/cyst (1 x 1/2 = 1/2 mark)
- c) Procedure of handling a heifer when administering a liquid deworming drug.
- Restrain the heifer in a crush
  - Hold it by the nostrils and lift up its head
  - Open its mouth
  - Release the drug into the mouth as far back as possible/place the drenching gun/bottle on the mouth
- (Mark until the procedure is broken 2 1/2 marks)
- 5 x 1/2 = 2 1/2 marks)
23. a) Granary/modern store/crib (1 x 1/2 = 1/2 mark)
- b) Function of M
- Prevents entry of rodents into the store.



- To keep off vermins (1 x 1/2 = 1/2 mark)

c) Maintenance practices on the structure

- repair and replace worn out parts
- Cleaning
- Fumigating/dusting with appropriate pesticides. (2 x 1/2 = 1 mark)

a) N - Tank

P - delivery note rej. hose pipe/hose alone

Q - trigger

R - Lance

b) Function of S

- Breaks the liquid chemical into desired size of droplets/spray form/fume droplets/jets (1 x 1 = 1 mark)

25. a) Dairy breed (1 x 1/2 = 1/2 mark)

b) Friesian/Jersey/Guernsey/Ayrshire (1 x 1/2 = 1/2 mark)

c) Physical characteristics of dairy cattle

- Wedge/triangular shaped
- Straight topline
- Large and well developed udders teats
- Prominent milk veins
- Lean bodies/thinly fleshed waters
- Large stomach
- small head and long neck
- Well set wide hind quarters
- Prominent/visible pin bones
- Long thin legs

26 a) Advantages of artificial insemination

- Controls breeding diseases/parasites
- Controls breeding
- Is a quicker method of obtaining a proven bull
- Is easy and cheap to transport semen to far areas
- Semen from a superior bull can be used to serve many cows
- Farmers who cannot afford to buy a superior bull can access the service at a low cost
- Bulls that cannot serve naturally due to physically injuries/defects can be utilized.
- Prevents injuries to cows by heavy bulls
- Danger of injury/damage by aggressive bulls is eliminated
- Semen can be stored for a long period even after the death of the bull
- Saves the cost of rearing a bull
- Controls in breeding
- It is a useful research tool. (5 x 1 = 5 marks)

b) Signs of Trypanosomiasis (Nagana) disease in livestock

- General body weakness/dullness
- Reduced milk production
- Swollen lymph nodes
- Rough coat and cracked skin where there is no hair
- Running eyes/lachrimation which can result in blindness/sunken eyes
- Diarrhoea
- Emaciation/loss of weight



- Loss of hair toward the tail end
- Abortion in pregnant females
- High fever/temperature
- Anaemia
- Loss of appetite
- Swollen parts of the belly (10 x 1 = 10 marks)

c) Functions of water

- Component of body cells and many body fluids e.g blood
- Used in biochemical reactions in the body e.g digestion
- Regulates body temperature through sweating and evaporation
- Excretion of metabolic wastes from the body
- Formation of products e.g milk, eggs etc
- Makes cells turgid to maintain their shape.
- Transportation of nutrients from one part of the body to another (5 x 1 = 5 marks)

27. a) Use of the various parts of a zero grazing unit in dairy farming.

- Milk recording room - weighing and milking records
- Milking stall - rearing calf to weaning
- Calf pen - rearing calf up to weaning
- Sleeping cubicles - provide shelter and warmth
- Loofing area - dunging, feeding, exercise and sunning
- Feed and water troughs - feeding and watering the animals
- Feed preparation room - preparing feed rations and cropping fodder rej. chaff cutter region
- Store - storing/keeping dairy equipment/feeds
- Manure storage areas storing measure

Parts is tied to the function

6 x 1 = 6 marks

b) How power transmitted from a tractor engine is made available for use on a farm.

i) Propeller shaft

- connects gear box to the differential which has wheel axles
- Wheel axles rotate to move the tractor and push or pull trailed implements.

(2 x 1 = 2 marks)

ii) Power take Off (P.T.O) shaft

- Rotates at the same speed as the crankshaft.
- Its connected to machines e.g mowers, sprayers, shelters etc to perform farm operations (2 x 1 = 2 marks)

iii) Hydraulic system

- Is attached to the three-point linkage or attached on hydraulic mechanism trailer.
- the three point linkage operates (raises/lowers) the mounted implements during farm operations or for off loading (2 x 1 = 2 marks)

c) Ways in which ticks can be controlled

- Burning infested pastures to kill developmental stages. (1/2 mark for stating)
  - Rotational grazing to starve and kill developmental stages. (1/2 mark for sta
- hand picking and killing the ticks.
- Fencing off pasture land and farm to keep away infested animals/double feeding re. fencing al
- Ploughing pasture land to burry and kill developmental stages.
- Top dressing pasture using lime to kill the ticks.
- Spraying using acaricides/had dressing/dipping to kill ticks.
- Use of natural enemies - eat the



28. a) Characteristics of a poor layer.

- Combs and wattles - small/shrivelled/shrunken. dry scaly and place.
- eyes - dull and pale yellow.
- Beak - yellowish in colour.
- Abdomen/breast - hard and full
- Vent - round, dry and less active
- Space between keel and pelvic bone - small and fits only one or two fingers
- Plumage - preened & glossy (smooth) beautiful
- Moulting - early morning
- Shanks/feet - Yellowish in colour
- Broodiness - Is common/early moulting
- Temperature - easy and dull

Mark as whole

Accept - poor layer is inactive. (10 x 1 = 10 marks)

- Free from disease causing micro-organisms/pathogens
- Free from hair, dirt or dust.
- Free from bad odours and tastes/has good flavours.
- Chemical composition within expected standards. (3 x 1 = 3 marks)

ii) Factors influencing milk composition

1) Age of animal

- Butter fat in milk becomes less as an animal grows old thus young animals produce milk with higher BF than older animals.

1) Breed differences rej. species of the animal

2) Different breeds of cattle produce milk with differing percentage composition e.g Jersey produce higher BF than Friesian.

3) Type of food eaten by an animal

Roughage feeds produce milk with higher fats, lactose and protein compared to grains.

4) Diseases

Diseases such as mastitis reduce the lactose composition in milk because bacteria attack milk sugars.

5) Physiological condition of the animal.

Sick/extremely emaciated animals register low percentage of BF/during late pregnancy cows produce milk with low BF content.

-6) Stage of lactation

The BF content in milk is highest at the middle phase of the lactation period and lowers towards end of lactation.

7) Completeness of milking

Milk drawn last from udder during contains high BF content/last drop milk has BF content produce in the milk.

8) Season of the year - accept environmental condition

BF content increases during cold seasons.

9) Time of milking

- Milk produced in the morning has a lower BF content than milk produced in the evening

1/2 factor method

1/2 mk explanation (7 x 1 = 7 marks)

