

**ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
(ZIMSEC)**

GENERAL CERTIFICATE OF EDUCATION

ORDINARY LEVEL

AGRICULTURE

**PAST QUESTION PAPERS
AND EXPECTED ANSWERS**

PAPER 1

OCTOBER 1995

- 1A). The National Agriculture programme, associated with passing information to farmers is an example of
- a). Education
 - b). Extension
 - c). Research
 - d). Resettlement
- B). An example of a pair of browsers is
- a). cattle, goats
 - b). pigs, sheep
 - c). donkeys, rabbits
 - d). horses, chickens
- C. An implement which makes a fine tilth is a
- a). cultivator
 - b). harrow
 - c). plough
 - d). ridger
- D. Weathering is defined as the
- a). Damaging of crops by hail storm
 - b). breaking down of rocks into small particles
 - c). washing away of top soil by rainfall
 - d). removal of minerals from soil
- E. An example of a fixed cost is the cost of
- a). electricity
 - b). fertilizer
 - c). rent
 - d). seed

- F). Water carried up the plant stem through the
- a). cambium
 - b). phloem
 - c). pith
 - d). xylem
- G). A government measure which avoids the spreading of animal disease is
- a). breeding
 - b). weaning
 - c). quarantining
 - d). subsidizing
- H). Carbon dioxide is used by a plant during
- a). Osmosis
 - b). Photosynthesis
 - c). Respiration
 - d). Transpiration
- I). Waterlogged soils can be improved by
- a). draining
 - b). irrigating
 - c). leaching
 - d). mulching
- J). Soil erosion can be increased by
- a). removing vegetative cover
 - b). planting cover crops
 - c). adding organic matter
 - d). applying agricultural lime
- K). The fluid in which sperms swim during mating is produced in the

- a). Penis
 - b). Seminal vesicles
 - c). testes
 - d). vas deferens
- L). What is the weight of pesticide required to mix with 15 litres of water if the dilution rate is 1kg to 500 litres?
- a). 20g
 - b). 30g
 - c). 45g
 - d). 50g
- M). The development of algae in water storage tanks can be prevented by
- a). painting
 - b). plastering
 - c). roofing
 - d). screening
- N). Wooden posts are treated with creosote to prevent
- a). breaking
 - b). discolouration
 - c). rotting
 - d). shrinkage
- O). Ant heap soil is used in core- trenches because it is
- a). fairly cheap
 - b). easily available
 - c). impervious to water
 - d). porous to water
- P). The application of nitrogenous fertilizers is more frequent on sandy soils because of
- a). high leaching

- b). low acidity
- c). poor drainage
- d). good aeration

Q). Denitrifying bacteria are particularly active in soil which is

- a). acidic
- b). infertile
- c). waterlogged
- d). well – drained

R). Cultural methods of weed control include

- a). correct spacing, weed killers, hoes
- b). cultivating, selective herbicides, hand pulling
- c). hoes, cultivators, weed killers
- d). crop rotation, correct spacing, early planting

S). An important requirement for cereals during flowering is the availability of

- a). manure
- b). moisture
- c). sunlight
- d). warmth

T). A practice which allows grass in pastures to seed is

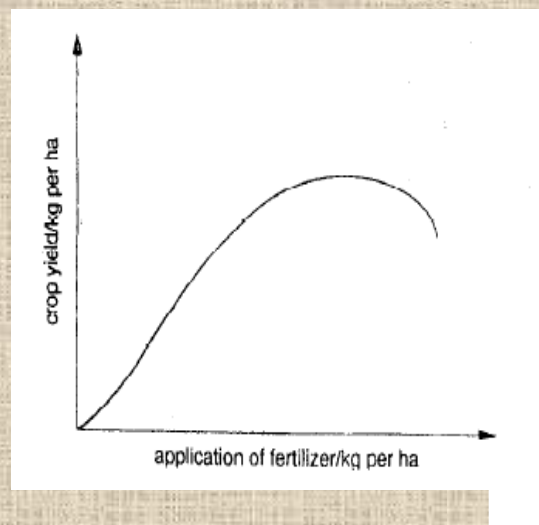
- a). destocking
- b). over grazing
- c). overstocking
- d). resting

U). A practice which reduces pest attack is

- a). heavy manuring
- b). continuous monoculture
- c). conservation tillage
- d). crop rotation

V). The correct order of land preparation is

- a). discing, stumping, ridging, ploughing
 - b). ridging, stumping, discing, ploughing
 - c). stumping, ploughing, discing, ridging
 - d). stumping, ploughing, ridging, discing
- W). A soil's effective depth refers to the zone where
- a). limiting layers are found
 - b). ploughing is done
 - c). fertilizers are incorporated
 - d). seed is sown
- X). The pH range in which soil microbes thrive best is
- a). 1,5 – 3,6
 - b). 5,5 – 7,8
 - c). 8,2 – 10,5
 - d). 11,4 – 13, 6
- Y). Which economic principle is shown by the graph below?



- a). supply curve
- b). demand curve
- c). diminishing returns
- d). opportunity costs

Section B

2a). Define the following terms, as used in Agriculture

- i). vulva
- ii). lubrication
- iii). Ovule
- iv). Coppice

b). State three measures farmers would take to prevent the spread of notifiable diseases.

3a). Explain the importance of each of the following in the nitrogen cycle.

- i). lightning
- ii). nitrifying bacteria
- iii). Nitrogen – fixing bacteria

b). State three methods which can be used to improved quality of livestock.

c). How can excessive irrigation be harmful to crops?

4. Fig 1 shows the reproductive system of a female animal.

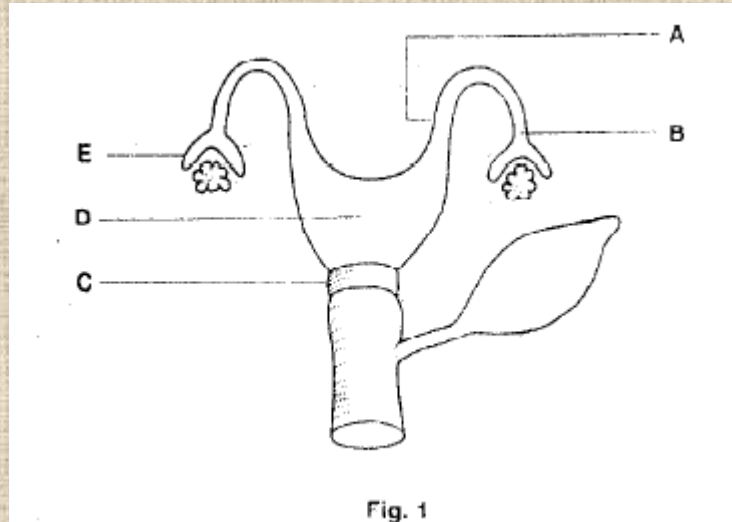


Fig. 1

- a). Name the parts labeled A and E.
- b). What are the functions of the parts labeled B, C and D.
- 5a). For either chicken or rabbits, state with reasons, four management practices to improve productivity.

Chosen animal

Practice	Reasons
1.....
2.....
3.....

.....
4.....
.....

.....
.....
.....

b). A farmer plants a cereal crop at a spacing of 900mm by 300mm in a field measuring 100m by 50m

i). Calculate the expected plant population to the nearest thousand. Show all your working.

ii). If the top dressing rate is 200kg/ha, calculate the weight of ammonium nitrate to be applied per plant. Show all your working. (2)

6a). State three ways through which soil fertility can be lost from arable lands. (3)

b). State two ways of improving alkaline soils. (2)

c). How can moisture be conserved in arable lands? (2)

7. Fig 2 shows part of the digestive system of a ruminant.

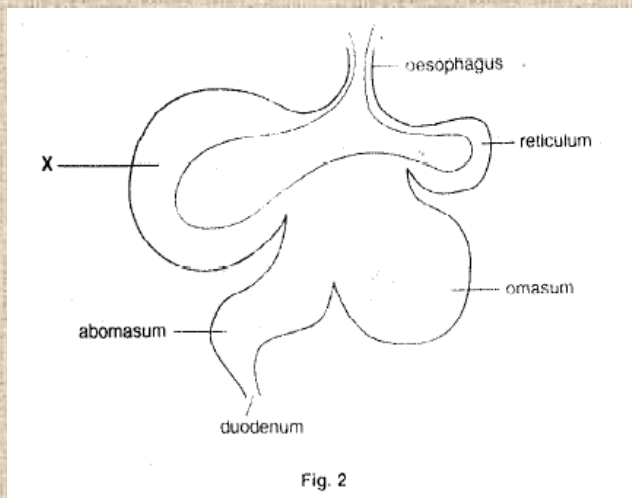


Fig. 2

- a). Name the part labeled X in the diagram. (1)
- b). Show by arrows, in the diagram, the direction of food movement. (5)
- 8a). Explain how the use of paddocks improves grazing pastures. (4)
- b). State two reasons why exotic trees are grown in Zimbabwe more than indigenous trees. (2)
- c). State two measures which are taken to protect farm tools during storage. (2)
- 9a). Explain the term minimum tillage. (1)
- b). What are the advantages of minimum tillage? (4)

Section C

Option 1 – Crop Husbandry

- 10a). Describe, giving examples, the different types of records a farmer should keep in crop production.
- b). Explain the advantages of keeping these records.
11. Describe how weeds can
- a). spread
b). be controlled
- 12a). Describe how weeds can
- i). nutritional deficiencies
ii). waterlogging
iii). Capping
iv). Frost
- b). Explain how a farmer can prevent and control disease attack on crops.

Option 2 – Livestock husbandry

13. For either coccidiosis or trypanosomiasis, write short notes on the following:
- i). name of disease and name of host
ii). cause
iii). Symptoms
iv). Prevention
v). treatment (10)
- 14a). Write short notes on
- i). maintenance ration
ii). production ration (4)
- b). Describe the importance of roughage, fats and a named vitamin in animal feeding. (6)
- 15a). For a named farm animal describe factors considered when selecting a female for breeding. (5)

- b). Describe the preparation, storage and marketing of one named animal product. (5)

Option 3 – Horticulture and Lawn Management

- 16. Describe the production of a named flower under the following headings:

- i). name the flower
- ii). raising seedlings
- iii). Preparing a potting mixture
- iv). Preparing the flowers for marketing

- 17a). Outline methods of weed control in ornamental plants

- b). Describe the damage and control of a named pest attacking a named ornamental plants.

- 18a). Describe how you would establish a lawn.

- b). Describe the maintenance of a named lawn grass.

Option 4 – Farm structures and Machinery

- 19. Explain the functions of the following parts of an engine:

- a). connecting rods
- b). pistons
- c). cam shaft
- d). spark plug
- e). crank shaft (10)

- 20a). With the aid of labeled diagrams, describe two types of yokes used for harnessing draught animals. (6)

- b). Describe the advantages of using thatch grass rather than asbestos in farm buildings. (4)

- 21a). Describe the construction and maintenance of farm roads using the following headings:
- i). materials
 - ii). maintenance (5)
- b). Describe how a site for a farm building is selected and prepared. (5)

Possible Answers

November 1995

Agriculture 5035/ 1

Section A

- 1a). B
- b). A
- c). B
- d). B
- e). C
- f). D
- g). C
- h). B
- i). A
- j). A
- k). B
- l). B
- m). C
- n). C
- o). C
- p). A
- q). C
- r). D
- s). B
- t). D
- u). D
- v). C
- w). A
- x). B

y). B

Section B

Question 2

Define the following terms, as they are used in Agriculture:

Term	Possible Definitions
Valva	external part of female reproductive system
Lubrication	application of grease to moving parts to reduce friction
Ovule	developing seed
Coppice	shoots which grow at the base of a tree after harvesting

State tow measures farmers would take to prevent the spread of notifiable diseases.

Answer:

- vaccinate all animals
- restrict movement of animals
- report the disease outbreak to the police or veterinary officers

Question 3

Explain the importance of each of the following terms in the nitrogen cycle.

Term	Explanation
Lightning	converts atmosphere nitrogen into nitrates
Nitrifying bacteria	converts ammonium carbonate to nitrous acid which reacts with lime to form nitrates Nitrites are changed to nitrates by nitrobacter
Nitrogen fixing Bacteria	bacteria in the soil convert nitrogen from the air into nitrogen compound that can be used by the plant

b). State three methods which can be used to improve quality of livestock.

Answer

- cross breeding livestock
- selection of cows and bulls
- improve nutrition

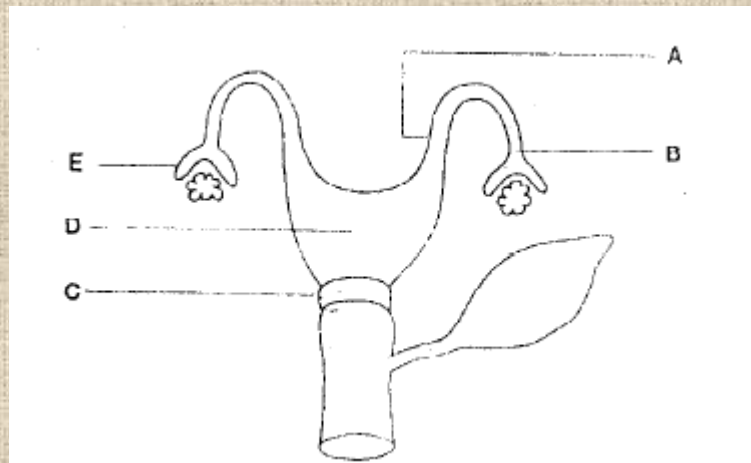
c). How can excessive irrigation be harmful to crops?

Answer

Too much water will cause erosion, water logging and will increase incidence of pests, diseases and weeds.

Question 4

Fig 1 shows the reproductive system of a female animal.



a). Name the parts labeled A and E.

Answer

- A - horn of uterus
- B - funnel

b). what are the functions of the parts labeled B, C and D?

Answer

- B).** **Fallopian Tube** – passage of eggs from the ovary/ carries eggs to uterus
- C).** **Cervix** – separates uterus and vagina, keeps out foreign bodies, opens to allow passage of young at birth.
- D).** **Uterus** – site for development of embryo
- embryo is attached or implanted

Question 5

a). For either Chickens or rabbits, state with reasons, four management practices to improve productivity.

Answers

<u>Practice</u>	<u>Reason</u>
Vaccination	- to prevent diseases
Feed balanced ration	- for fast growth
Supply fresh bedding	- for warmth and to prevent diseases
Provide clean water all the time	- water is an essential food component for easy digestion
clean run	- prevent disease and parasite outbreak

Rabbits

<u>Practice</u>	<u>Reasons</u>
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Clean hutches - Prevent disease and parasite outbreak
- Prevent diseases

Provide a balanced ration - for fast growth

Supply clean water all the time - water is essential for dissolving food nutrients

- b). A farmer plants a cereal at a spacing of 900mm by 300mm in a field measuring 100m by 50m.
- i). Calculate the expected plant population to the nearest thousand. Show working.

Answer

$$\text{Number of rows} = \frac{10\ 000}{90}$$

$$= 111.1$$

$$\text{Number of plants per row} = \frac{5\ 000}{30}$$

$$= 166.7$$

$$\text{Plant population} = 166.7 \times 111.1$$

$$= \frac{18\ 520}{19\ 000}$$

Or

$$\text{Number of rows} = \frac{5\ 000}{90}$$

$$= 55.5$$

$$\text{Number of plants per row} = \frac{10\ 000}{30}$$

$$= 333.3$$

$$\begin{aligned}\text{Plant population} &= 55.5 \times 333.3 \\ &= 18\,498 \text{ or } 18\,000\end{aligned}$$

- ii). If the top dressing rate is 200 Kg/ ha, calculate the weight of ammonium nitrate to be applied per plant.

Answer

$$\begin{aligned}10\,000 \text{ m}^2 & \text{ (1ha) requires 200kg of ammonium nitrate} \\ 5\,000 \text{ m}^2 & \text{ (100 x 50m) requires } + 10\,000 \times 2 \\ &= \frac{5\,000 \times 200}{10\,000} \\ &= 100 \text{ kg of ammonium nitrate}\end{aligned}$$

$$\begin{aligned}\text{Amount per plant} &= \frac{100\,000}{18\,500 \text{ g}} \\ &= 18\,000 \\ &= 5 \text{ g/ plant}\end{aligned}$$

Question 6

State ways through which soil fertility can be lost from arable lands

Answer:

- leaching
- erosion
- continuous cropping

State ways in which alkaline soils can be improved.

Answer:

- b). – application of large quantities of organic manure e.g. well rotted straw, leaves, sawdust, compost
- cultivation of fodder crops
 - use of gypsum to convert sodium clay to calcium clay
 - heavy irrigation to wash sodium salts deep down

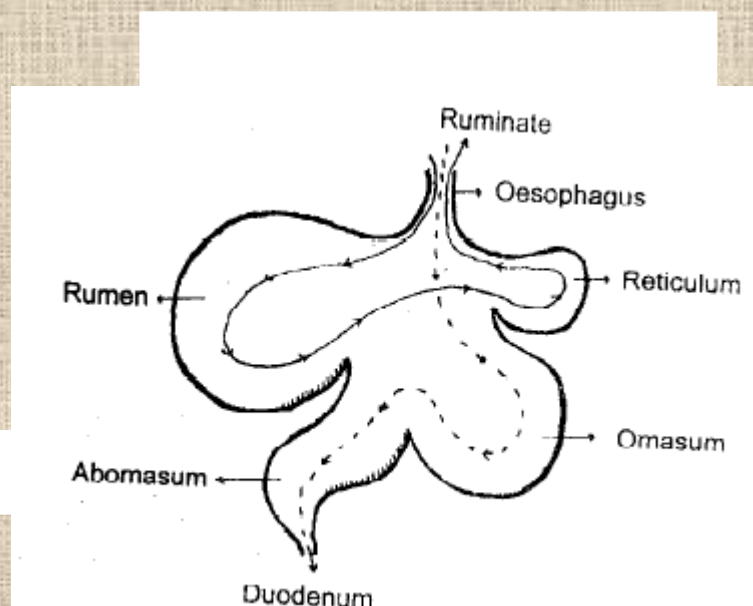
c). How can moisture be conserved in arable lands?

Answer:

- good crop cover or plant population, mulching.

Question 7

Fig 2 shows part of the digestive system in a ruminant



a). name the part labeled X

answer: Rumen

b). Show by arrows the direction of food movement.

Answer: the food moves as follows.

Question 8

Explain how the use of paddocks improves grazing pastures

Answer:

- palatable grasses can be grown
- allows seed formation
- there is a build up of food reserves in grasses
- fertilizers can be applied
- overgrazing is prevented

State two reasons which are taken to protect farm tools during storage.

Answer:

Paint the tools

Apply oil coating

Store tools in a shed or store room

Keep tools clean

Question 9

Explain the term minimum tillage.

Answer

- very little cultivation of the soil is done
- there is less disturbance of soil structure
- it reduces destruction of vegetation therefore reduces soil erosion

Section C

Candidates should choose one option only and answer any two questions from the chosen option. Candidates who answer more than two questions or answer two questions from different options will be penalized.

Option 1 – Crop Husbandry

Question 10

- a). Describe, giving examples, the different types of records a farmer should keep in crop production.

Answer:

Production records e.g. crop enterprises, livestock deaths, births and yields
Financial records e.g. income and expenditure accounts, profit/ loss accounts

- b). Explain the advantages of keeping these records

Production records:

- guide farmers in planning and making decisions
- facilitate seed selection
- identify areas needing improvement

Financial records:

- enable farmers to determine profit/ loss
- help farmers to obtain loans
- sharing of profits/ loss at the end of a growing season
- to assess income

Question 11

- a). Describe how weeds can be spread

Answer:

- can be spread by water
- animals/ birds
- wind
- explosive means

- b). Describe how weeds can be controlled

Answer:

Cultural control:

- correct spacing of crop plants in order to smother weeds, correct fertilisation for quick growth of plants
- crop rotation to suppress some weed species

Mechanical control:

- ploughing and harrowing
- hand pulling and hoeing

Chemical control:

- use of herbicides
- contact or systematic herbicides
- selective or non selective herbicides

Question 12

a). Describe how each of the following can cause damage to crops

	Crop damage caused
i). nutritional deficiencies	stunted growth colour change, less resistance to diseases and pests and death
ii). Water logging	yellowing of leaves stunted growth roots fail to respire death
iii). Capping	Seedling emergence is difficult Uneven germination Reduced air circulation in the soil.
iv). Frost	Slow plant growth kills plants

b). Explain how a farmer can prevent and control disease attack on crops.

Answer

- use of chemicals
- rotation
- destruction of diseased plants, rouging
- fallowing
- use of disease free certified seed
- avoid wetting leaves
- early/ late planting
- use of disease resistant cultivators

Option 2 Livestock Husbandry

Question 13

- a). For either coccidiosis or trypanosomiasis, write short notes on the following.
- i). Name of disease and host.

Answer

Coccidiosis, a disease that is particularly harmful to calves and poultry.

Cause:

It is caused by protozoa named eimeria tenella and Emerica necatrix

Symptoms

- droppings contain blood, animals look depressed or drowsy
- 75% of the animals die

Prevention

- change litter regularly
- feed coccidiostats
- isolate diseased animals quarantine

Treatment

- sulphur drugs in water or feed e.g. sulphamezathine, Embazin and ESB3.

Or

Answer

- | | |
|---------------------|---|
| i). Name of disease | Trypanosomiasis or Nagana |
| ii). Cause | Transmitted by tsetseflies caused by Protozoa
Called trypanosomes |
| iii). Symptoms | dull, rough coat
Watering eyes
Loss of weight
High body temperature/ fever
Paralysis in the hind quarters |

- iv). Prevention control/ spray tsetse flies
v). Treatment control with Berenil

Question 14

a). Write short notes on

i). Maintenance ration

- amount of food fed to an animal
- so that it does not lose or gain mass
- to maintain body temperature
- supply energy for breathing and blood circulation
- repair worn out and damaged tissue

ii). Production ration

- feeding livestock maintenance
- to produce milk, eggs, young, work and growth

b). Describe the importance of roughage, fats and a named vitamin in animals

Roughage

- aids digestion
- provides Volatile Fatty Acids
- maintain normal ruminal activity

Fats

- energy production and storage
- protection of vital organs
- regulation of body heat

Option 3: Horticulture and Lawn Management

Question 16

Describe the production of a named flower under the following headings

- i). Name of flower:
e.g. calceola, petunia, sweet pea, zinnia

- ii). Raising seedlings
 - good quality seed, certified seed
 - correct planting depth
 - light loam soils
 - well manured soils
 - marked nursery, seed box or green house
 - regular watering

- iii). Preparing a mixture
 - mix - 1 part loam soil
 - 1 part compost or well rotted manure
 - 1 part vermiculite

- iv). Preparing the flowers for marketing
 - dissolve fatty soluble vitamins

Vitamins

Essential for normal health/ growth

- A- resistance against disease
Prevents blindness

- D- essential in utilization of phosphorous and calcium

- E- essential in reproduction

- B- prevention of disease e.g. low hatchability and curly toe in poultry

Question 15

- a). For a named farm animal describe factors considered when selecting a female for breeding.

Answer:

- cattle or pigs

Selection of female animal for breeding consider the following:

- growth rate
- disease resistance
- food conversion ratio
- conformation
- breed type
- milk type
- litter size (pigs)
- number of teats

b). Describe the preparation, storage and marketing of one named animal product

Preparation of Animal product

Name of product : milk

Milk is cooled, filtered, pasteurized, refrigerated, packed and checked for quality

Question 17

a). Outline methods of weed control in ornamental plants

- use herbicides
- mechanical means e.g. hoeing or cultivation
- common weeds are couch grass, nut grass, blackjack
- biological control i.e. introducing insects that feed on the weeds

b). Describe the damage and control of a named pest attacking a named ornamental plant

Name of plant: zinnia/ caledula/ petunia/ sweet pea

Name of pest: badrada bug, harvester termite or chafet beetle
Caterpillars, cutworm, australlian bug, red scale,
Wooly aphids, carnation worm

Group pests according to	sucking and piercing Biting chewing Boring	
Sucking and piercing	biting/ chewing	boring
Damage: suck sap; pierce Leaves/ stems, Results in wilting Control : systematic pesticides Example: dimethoate	cut stems, chew leaves cut flowers control: contact pesticides example carbaryl	suck sap after boring into tissue e.g. eelworm, caterpillars control: contact Pesticide/ Fumigation

Question 18

a). Describe how you would establish a lawn.

- clear land, stump,
- dig/ plough : 230mm deep
- apply manure / fertilizer
- leveling, mark rows: 300 – 450mm apart
- suitable planting period, rainy season or beginning of rainy season
- suitable planting material runners, tufts or rhizomes
- cover planted material, apply adequate watering

b). Describe the maintenance of a named lawn grass

- top dressing with manure, compound or nitrogenous fertilizer, phosphatic fertilizer, or old tobacco manually
- spiking, filling with sandy soil, leveling, weeding, use of herbicides, disease and test control, mowing

Option 4 Farm Structures and Machinery

Question 19

Explain the functions of the following parts of an engine.

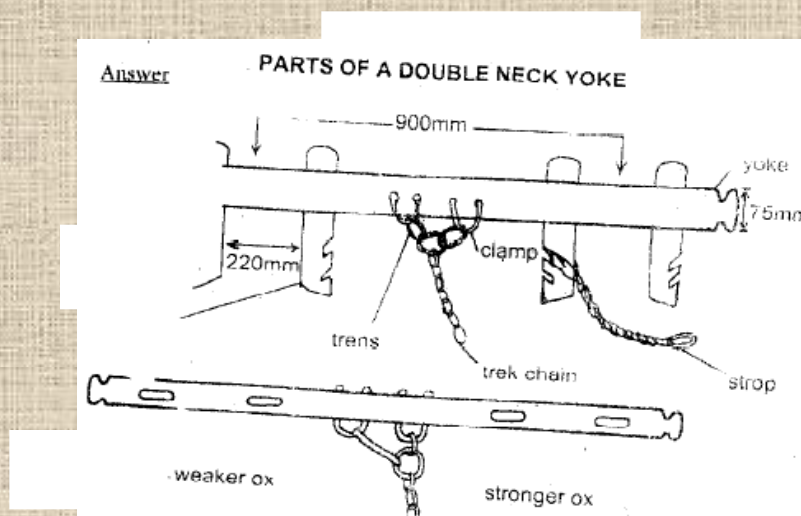
Part	Function
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- a). Connecting rods connecting piston with crankshaft, moving the crankshaft
- b). Pistons control the up and down movement in the cylinder
allow air/ petrol mixture in – pushes out exhaust gases
compresses air petrol mixture
- c). Camshaft connected to timing chain
connects with push rod to open and close valve
- d). Spark plug ignites air petrol mixture
- e). Crankshaft turns pistons, holds engine accessories in place
transmits power

Question 20

- a). With the aid of labeled diagrams, describe two types of yokes used for harnessing draught animals.

Answer:



b). Describe the advantages of using thatch grass rather than asbestos in farm buildings.

Answer

- thatch grass is cheaper than asbestos
- it is readily available on farms
- it is a better insulator than asbestos
- controls both sound and heat

Question 21

a). Describe the construction and maintenance of farm roads using the following headings.

i). Materials
- materials should be hard and not easily eroded

Examples: gravel soil
Stones (flat stones)
Bricks
Concrete
Tar

ii). Maintenance
- grade the road up and down to maintain slope and crest
- clearing drains out
- strengthening
- filling holes with gravel

b). Describe how a site for a farm buildings is selected and prepared
- Selection of site

Consider the following:

- topography of the land
- availability of water
- absence of dry prevailing wind and suns rays
- size of building
- proximity to main road and electricity
- panorama or view of surroundings

Preparation of site

- clear rocks and trees
- level the area
- mark out and peg

PAPER 1

OCTOBER 1996

Section A

1A). An underground stem that grows horizontally is a

- a. bulb
- b. rhizome
- c. runner
- d. tuber

B). Physical damage to plants is likely to be caused by increased

- a. evaporation
- b. humidity
- c. temperature
- d. wind

- C). A hormone produced in the male reproductive organs is
- oxytocin
 - progesterone
 - testosterone
 - relaxin
- D). A eucalyptus variety suitable for dry regions is
- camaldunensis
 - citriodora
 - grandis
 - tereticornis
- E). Transpiration is lowest under conditions of
- dry winds
 - high humidity
 - high temperatures
 - low rainfall
- F). The nutrient easily lost through leaching is
- magnesium
 - nitrogen
 - phosphorous
 - sulphur
- G). Atmospheric nitrogen is increased by
- lightning action
 - anaerobic bacteria
 - legume cultivation
 - nitrate fertilizers
- H). A suitable tool for removing seedlings from a nursery bed when transplanting is a
- dibber
 - fork
 - spade
 - trowel

- I). The substance used to raise soil pH is
- a. ammonium nitrate
 - b. agricultural lime
 - c. compound D
 - d. sulphate of ammonia
- J). Surface run off is caused by
- a. lower water run off
 - b. slow water penetration
 - c. ploughing along contours
 - d. ploughing across slopes
- K). A soil type which contains a high content of fine particles is
- a. clay
 - b. loam
 - c. sand
 - d. silt
- L). Crops which should follow each other in a rotation are those
- a. with similar root systems
 - b. with the same nutrient requirements
 - c. which are closely related
 - d. which belong to different families
- M). Superphosphate fertilizers promote the growth of
- a. fruits
 - b. leaves
 - c. roots
 - d. stems
- N). An essential nutrient for bone formation in livestock is
- a. iron
 - b. magnesium

- c. phosphorous
- d. potassium

O). Crops wilt when where there is too much

- a. drainage from the soil
- b. evaporation from the leaves
- c. respiration through the stomata
- d. translocation through the stem

P). The upward movement of moisture in soil is

- a. capillary
- b. infiltration
- c. percolation
- d. seepage

Q). Seed dressings are done to

- a. inoculate seed
- b. destroy cutworms
- c. kill seeds of weeds
- d. prevent fungal diseases

R). Gross margin is gross income less

- a. variable costs
- b. net farm profit
- c. overheads
- d. overheads and variable costs

S). Which of the following is a risk in agriculture economics?

- a. change in demand
- b. change in government policy
- c. damage by storm
- d. unavailability of labour

T). How much fertilizer would be applied on 250m^2 of land at the rate of 300kg/ha ?

- a. 6.0 kg
- b. 6.5 kg
- c. 7.0 kg
- d. 7.5 kg

U). The number of livestock units equivalent to animals weighing 1 500kg is

- a. 3
- b. 4
- c. 5
- d. 6

V). Growth of plant roots towards water is

- a. geotropism
- b. haptotropism
- c. hydrotropism
- d. phototropism

W). Construction of dams will

- a. reduce drought occurrence
- b. increase agricultural exports
- c. stop relief handouts
- d. reduce crop failures

X). To make good quality cement blocks, the soil ingredients should be

- a. coarse sand
- b. fine sand
- c. clay soil
- d. loam soil

Y). The price of cereals during years of drought is high because supply is

- a. high and demand high
- b. low and demand high
- c. high and demand low
- d. low and demand low

Section B

2a). Explain why cattle lose body condition in winter, even when there is plenty of grass. (3)

- b). State three advantages of zero grazing. (3)
- c). In which part of the female's reproductive tract.
 - i). is the egg normally fertilized? (1)
 - ii). does the embryo develop? (1)
- 3. Study the diagram of the digestive system of a ruminant below and answer the question that follow

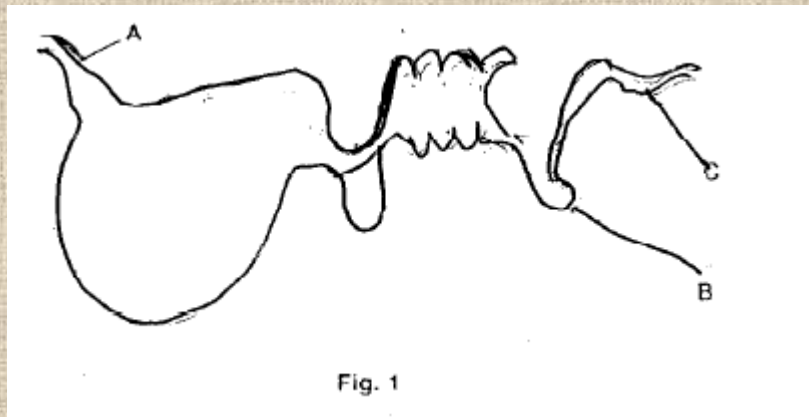
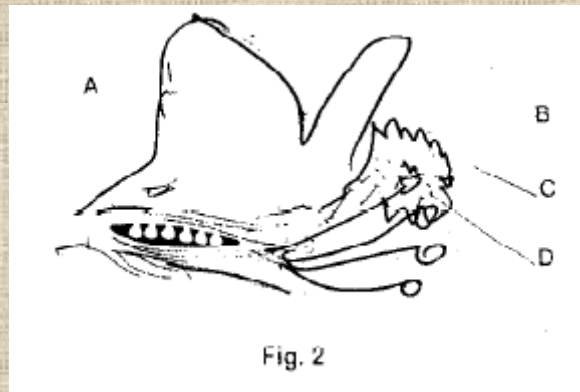


Fig. 1

- a). Name these parts: A, B, C (3)
- b). Where is cellulose digested?
- c). What is the function of roughage in the diet? (1)
- 4a). State three ways in which wildlife contributes to the economy of Zimbabwean. (3)
- b). Describe two methods of draining waterlogged areas. (2)
- 5. Fig 2 is a diagram showing a section through a beam flower.



- a). Name the structures labeled (A – D). (4)
- b). State the functions of the structures A and B. (2)
- 6a). State the differences between each of the following pairs of terms:
- i). variable costs and fixed costs (1)
 - ii). soil texture and soil structure (1)
 - iii). Straight fertilizers and compound fertilizers (1)
 - iv). Contact insecticides and systemic insecticides (1)
- b). Explain the importance of legumes in agriculture (4)
- c). Explain how plants use water. (2)
- 7a). What are the advantages of using inorganic fertilizers in agriculture? (2)
- b). State three factors that must be considered before starting an agricultural enterprise (3)

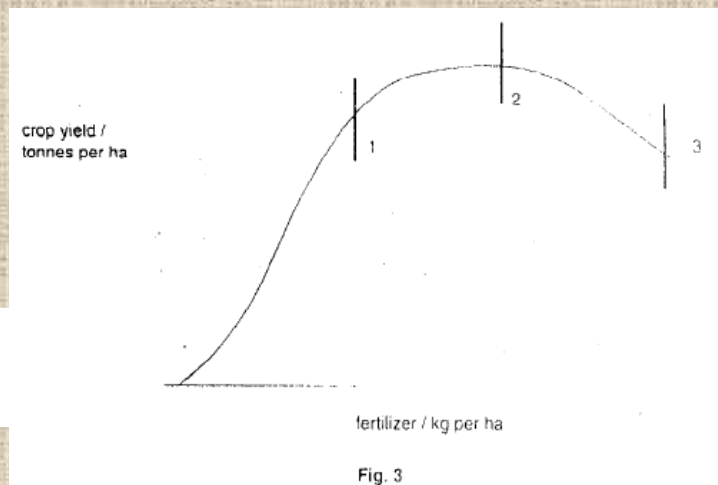
8a). With the aid of the diagram below, explain the hydrological cycle.



b)i. What causes coccidiosis? (1)

ii). State three ways of controlling coccidiosis. (3)

9a). Fig 3 shows the relationship between crop yield and fertilizers applied.



Explain the relationship between the yield and the fertilizers at points marked 1, 2, and 3.

At point 1

At point 2

At point 3

- b). State three advantages to farmers of maintaining up to date financial records. (3)

Section C

Option 1 – Crop Husbandry

10a). Describe the records that a farmer should keep in growing of a named legume crop. (5)

b). Explain the uses of each of the records mentioned. (5)

11a). Explain the effects of drought, wind and hail on crops. (5)

b). Describes the measures the farmer can take to minimize the effects of the crop hazards mentioned in 11(a) above. (5)

12a). Explain the cultural methods of weed control. (4)

b). Describe the advantages and disadvantages of using cultural weed control methods. (6)

Option 2 – Livestock Husbandry

- 13a). For a named farm animal, describe how its young is reared up to weaning. (6).
b). What physical records should be kept for the named animal above? (4)
- 14a). Describe how animal diseases can spread. (5)
b). How can disease be prevented or controlled? (5)
15. For a named farm animal, which is not a ruminant, describe
a). a suitable housing system (4)
b). the feeding programme for a mature animal (6)

Option 3 – Horticulture and Lawn Management

16. For a named pot plant discuss how
a). the cuttings are prepared
b). the rooting medium is prepared
17. Describe the management practices, including timing, carried out a named flower under following headings:
a. watering
b. application of fertilizers / manures
c. harvesting
18. Discuss the preparation, storage and marketing of a named flower for export

Option 4 – Farm Structures and Machinery

19. Describe the routine maintenance measures on an engine's
a. air supply
b. fuel system
c. lubrication system
20. Outline the maintenance required for the following implements
a. cultivator

- b. planter
- c. harrow

21.a. With the aid of a labeled diagram, identify the parts of a mould board plough?

b). Describe the functions of any three parts of a mould board plough.

Possible Answers

October 1996

- a). B
- b). D
- c). C
- d). A
- e). B
- f). B
- g). B
- h). D
- i). B
- j). B
- k). A
- l). D
- m). C
- n). C
- o). B
- p). A
- q). D
- r). A
- s). C
- t). D
- u). A
- v). C
- w). D
- x). A
- y). B

Question 2

- a). Explain why cattle lose body condition in winter even when there is plenty of grass.

Answer:

- a declining protein content in feed/ grass/ low palatability
- slower rate of intake of food due to a decline in protein content
- a decline in the cellulolytic bacteria population in a rumen due to low protein levels / slow digestibility / more fibrous
- passage of food through the digestive tract is slow

- b). State three advantages of zero grazing

Answer:

- achieve higher grades/ higher quality
- increase turn over/ profit/ manure can be obtained easily
- early maturity / fast growth/ efficient use of food
- take advantage of seasonally high price
- easy control of parasites / diseases / environment

- c). In which part of the female's reproductive tract:

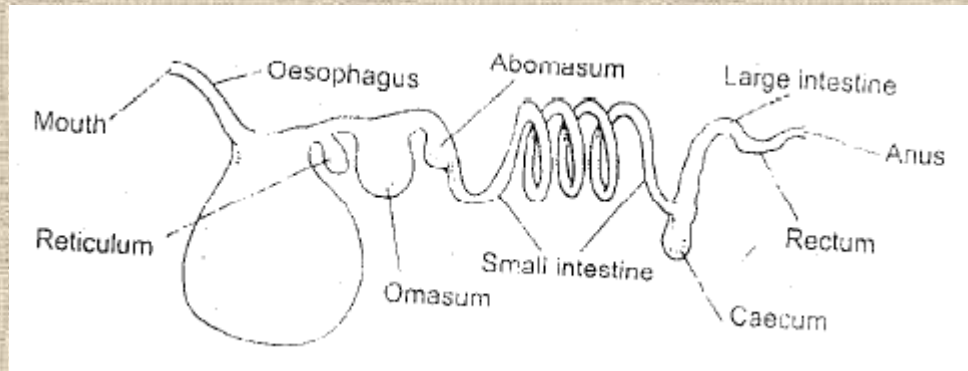
- i). is the egg normally fertilized?
ii). does the embryo develop?

Answer:

- i). fallopian tube
ii). uterus

Question 3

- a). Study the diagram of the digestive system of a ruminant below and answer the questions that follow



Where is cellulose digested?

Answer:

Rumen, reticulum and omasum

What is the function of roughage in the diet?

Answer:

- prevent constipation
- maintains peristaltic movements
- source of energy
- provide bulk in food

Question 4

a). State ways in which wild life contributes to the economy of Zimbabwe.

Answer:

- provide foreign currency/ revenue
- through sale of animal products such as hides/ skins/ ivory/ by- products
- through tourism/ foreign visitors
- provides employment ; source of food, recreation

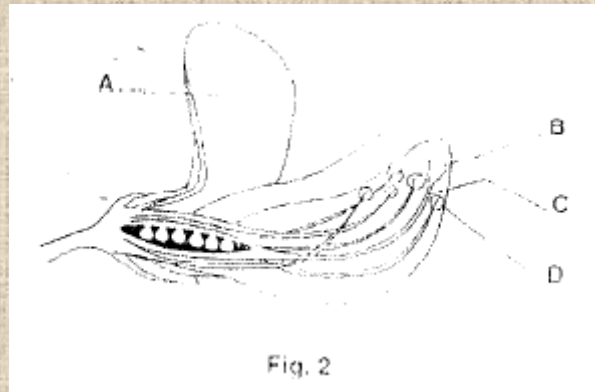
b). Describe methods of draining water logged areas.

Answer:

- tile drainage
- perforated pipes placed one metre below ground to drain excess water
- open ditch furrow drains
- excavate land to make a ditch in which water flows down the slope thereby lowering water table

Question 5

- a). Figure 2 is a diagram showing a section through a bean flower



Name the structures labeled A – D

Answer:

- A petal
- B stigma
- C style
- D anther

State the functions of the structures A and B.

Answer:

- A attracts insects of flowers
- B receives pollen grains, site for pollen germination

Question 6

State the differences between the following

- i). Variable and fixed costs:

answer:

- variable costs can be allocated directly to an enterprise e.g. lime, seed etc for a crop enterprise and fixed costs or overheads cannot be allocated to a particular enterprise e.g. rates, interest on loans.
- Variable costs change with the size of the enterprise and fixed costs do not change

ii). Soil texture soil structure

answer:

- texture is the size/ coarseness/ fineness of soil particles and structure is the arrangement of soil particles

iii). Soil texture and soil structure

Answer

- straight fertilizers contain only one major nutrient. Compound fertilizers are mixtures which contain more than one.

iv). Contact and systematic insecticides

Answer:

- contact insecticides are absorbed through the skin/ cuticle of the pest and the insect gets poisoned while systematic insecticides are absorbed by the plant first and the plant becomes poisonous to pests, sap suckers are mostly affected.

b). Explain the importance of legumes in Agriculture

answer:

- rich in proteins, useful as hay, improve pastures
- fix nitrogen into the soil/ improve fertility, reduce use of nitrogenous fertilizers / costs

c). Explain how plants use water

- used in transpiration to cool the plants
- combines with CO₂ in the presence of light to produce carbohydrates / oxygen
- a solvent for nutrients/ translocation
- a medium for all chemical process in the plant
- Used in germination
- Major component of plant tissue

Question 7

What are the advantages of using inorganic fertilizers in agriculture

a). Advantages of inorganic fertilizers

Answer:

- nutrients readily available for plant use
- facilitate estimates of crop yields
- plant nutrients are definite proportions
- less storage space/ less bulk
- specific nutrients can be applied

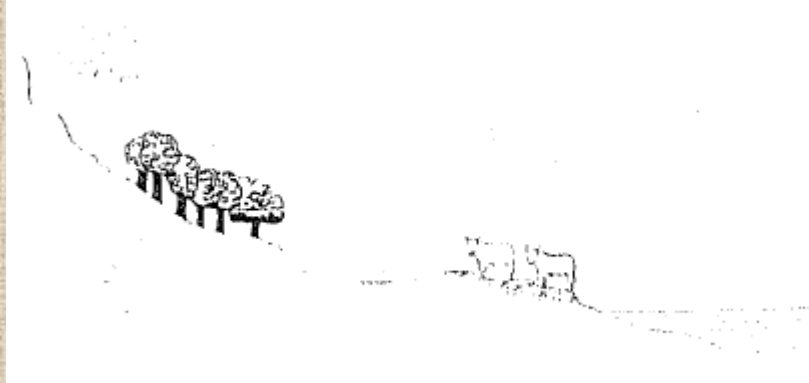
b). State factors that must be considered before starting an agricultural enterprise

Answer:

- finance, source/ amount; expense / capital
- market; profitability/ viability/ income
- purpose of product
- labour
- transport
- skill
- land/ soil type; climate; storage/ housing
- farmers preferences; water

Question 8

With the aid of the diagram below explain the hydrological cycle



Answer:

Evaporation from rivers/ lake; transpiration from trees/ grass and soil evapo transpiration; warm air rises; cools/ condenses; cloud formation, rain falls/ precipitation; flows as run off/ enters the soils; breathing perspiration from animals

b).i. What causes coccidiosis?

Answer

Protozoa/ Eimeria tenella/ Coccidia/ Eimeria necatrix

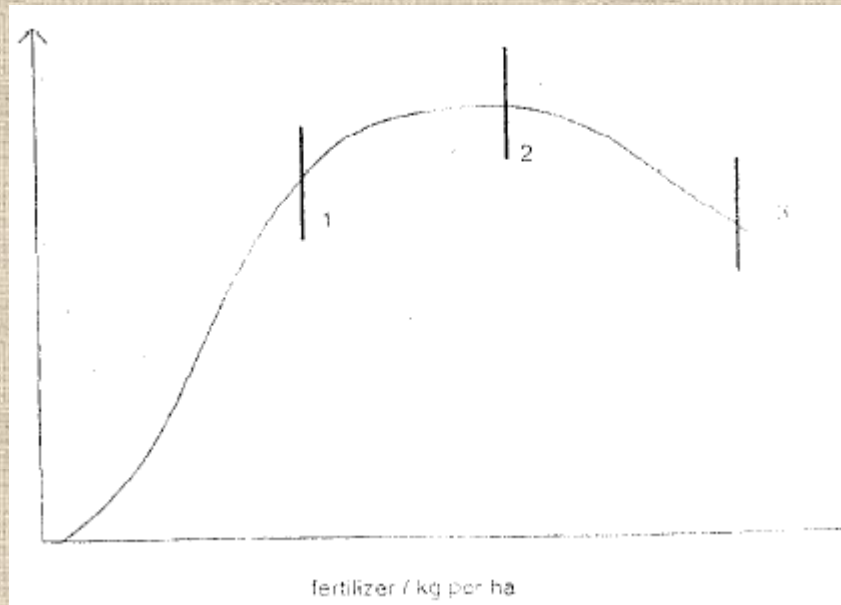
ii). State any three ways of controlling coccidiosis

Answer

- sulphur drugs e.g. sulphamezathine embazine/ amplor
- change litter
- separate older animals from young ones
- hygiene
- isolation/ quarantine
- provide feed with coccidiostas

Question 9

Figure 3 shows the relationship between crop yield and fertilizers applied. Explain the relationship between the yield and fertilizer at points marked 1, 2 and 3.



Answer

- Point 1 the more fertilizer applied the higher yield, resources not fully utilized
- Point 2 shows highest possible yields/ optimum fertilizer level; resources are fully utilized.
- Point 3 yields decrease with further additions of fertilizer/ low of Diminishing returns; over utilization of fertilisation

b)i. State three advantages to farmers of maintaining up to date financial records.

Answer

- find out whether one is operating at a loss / profit
- guide farmers in planning/ decision making, obtain loans
- calculation of tax
- compare the performance of different enterprises
- for farm evaluation

Poor yields

Wind - necessary for pollination in some plants
An agent for dispersal of seed
Can have a cooling effect – increasing rate of evaporation
Strong winds cause crops to dry up
Can break branches, stems and fruits dropping
Spread pests and diseases fast

Hail shred leaves, flowers and crop stems
Cause branches, stems and fruits to break

b). Describe the measures that a farmer can take to minimize the crop hazards mentioned in 11 (a)

Question 14

a). Describe how animal diseases can be spread

Answer

Diseases are spread by:

- vectors
- air borne
- water borne, food borne
- contact, mating
- infection- sneezing/ coughing/ breathing/ saliva

b). How can disease be prevented or controlled?

Control/ prevention

Answer:

- hygiene / clean housing/ feeding/ watering troughs
- disinfection
- inoculation/ vaccination/ immunization
- hand dressing/ dipping / dusting/ control
- vectors / internal parasites / correct nutrition
- control internal parasites i.e dosing/ drenching

- use of drugs/ antibiotics
- isolation/ quarantine
- control cattle movement/ products such as semen
- slaughter/ burn/ burry affected

Question 15

For a named farm animal, which is not a ruminant describe

a). a suitable housing system

Type of food

- mixed grain/ poultry grain
- grit greens/ grass/ forage

How often

1 – 2 times a day

Clean water should always be available

Amount – ad- lib

Feeding programme for a boar or a sow.

Type of food: boar or sow meal

How often : 1 – 3 times daily, clean water should be always available

Amounts

Dry sow from weaning to service 3 to 3.7kg/ day

First 12 weeks of pregnancy 1.8kg – 2.7kg / day

12 weeks – farrowing 2.3kg – 3.2 kg/ day

Suckling sows – 2kg + ½ kg for every piglet

Boar should be fed 1.8kg – 2.3kg / day

Depending on size.

Option 3 – Horticulture and Lawn Management

Question 16

For a named pot plant discuss how the cuttings are prepared.

Answer

Names of pot plants: coleus / cyclamen / gloxinias/ begonias/ lobelia/ ferns/ funchias.

Answer

PIG

Boar / sow

Housing: dry sows on pastures / communal pens facing boar, boar kept alone

Pregnant sow – farrowing pen / with farrowing rails/ crate

Suckling sow/ pen with creep areas

House should have enough space for feeding / dunging/ lying

Roof: thatch / asbestos

Walls: strong wall; bricks/ stones plastered for easy cleaning

Floor: concrete/ not too smooth/ rough

Strong doors

Provision of food / troughs/ water troughs/ nipples

Or Pigeons/ Ducks/ Turkeys/ Geese

Suitable Housing system

- security wind/ rain/ sun/ predators/ thieves
- provision of water ponds/ troughs
- provision of nests/ incubators / brooders
- provision of perches

- adequate ventilation

roof: thatch/ asbestos/ iron sheets

walls: brick/ stones/ poles/ wire netting/ Hessian

floor: bricks/ concrete / gravel/ earth/ stones/ poles/ wire netting

b). Feeding Programme for mature animals

Answer

Type of animal ducks/ geese.

- shoot/ root/ leaf cutting used
- 100 to 150mm long, current year's growth
- Node/ joint; treat with rooting hormone e.g. Seradix B, plant in rooting medium, water

The rooting medium is prepared.

Answer

- mix, sand and peat
- sand, peat and loam/ equal parts by volume pumice powder, vermiculite
- loam soil, manure and vermiculite/ equal parts by volume
- good moisture holding capacity
- good aeration
- sterilize the medium
- good drainage

Question 17

Describe the management practices including timings carried out on a named flower under the following headings (a) watering (b) application for fertilizer or manure (c) harvesting

Answer:

Names of flowers:

Annuals: antirrhinum / chrysanthemum / cosmos / sweet pea/ clarkia/
anemone / etc

biennials: wallflower / sweet William/ viola/ sweet sultan

perennials: geum/ honey suckle/ lavender/ primula/ verbena/ daisy

Watering

- for seedlings, gentle watering, fine rose
- established plants: irrigation cycle once every 3 days
- method of irrigation e.g. watering can/ sprinklers/ trickled/ drip
- mulching
- fertigation

b). Application of fertilizer

- rate of application 70g, gms/ m² compound D or X as initial application
- top dressing; nitrogenous fertilizer/ compound fertilizer
- type of manure: compost / kraal
- fertigation
- forking, watering

c). Harvesting

- remove waste leaves, cut flower with 450mm stem length
- tie into bundles, when ready
- refrigerate / cool
- grade, and pack the flowers

Question 18

Discuss the preparation, storage and marketing of a named flower for export.

Answer:

Name of flower: Stokesia/ carnation/ gladioli/ antirrhinum/ molecula/ roses
etc.

Preparation

- trim stems to length
- grading
- bunching
- tying
- number per bunch
- pack the flowers in plastic bags and boxes

Storage

- Store in cardboard boxes

- For preservation of flowers / florabac
- Store flowers in a cool place e.g. refrigerator

Marketing

- processing
- packing/ labeling
- advertising
- transport arrangement
- export promotion
- use of florabac

Option 4 – Farm Structures and Machinery

Question 19

Describe the routine maintenance measures on an engine's

i). Air supply system

Answer:

- check excessive dust/ blow dust out of paper filter
- Clean dirty sediment bowl
- Replace dirty oil in bath / sediment bowl
- Keep pre- cleaner/ remove dirt when necessary

ii). Fuel system

Answer

- keep fuel tank clean/ sediment bowl
- keep pipe connections tight; fit new valves on diaphragm according to manufacturers instructions
- replace fuel filter according to manufacturers manual
- keep injector pump clean
- keep carburetor clean/ remove dirt when necessary

iii). Lubrication system

Answer

- oil sump to be emptied when dirty / oil change
- replace oil filter according to manufacturers instructions
- use of oil correct viscosity

- check oil level / daily

Question 20

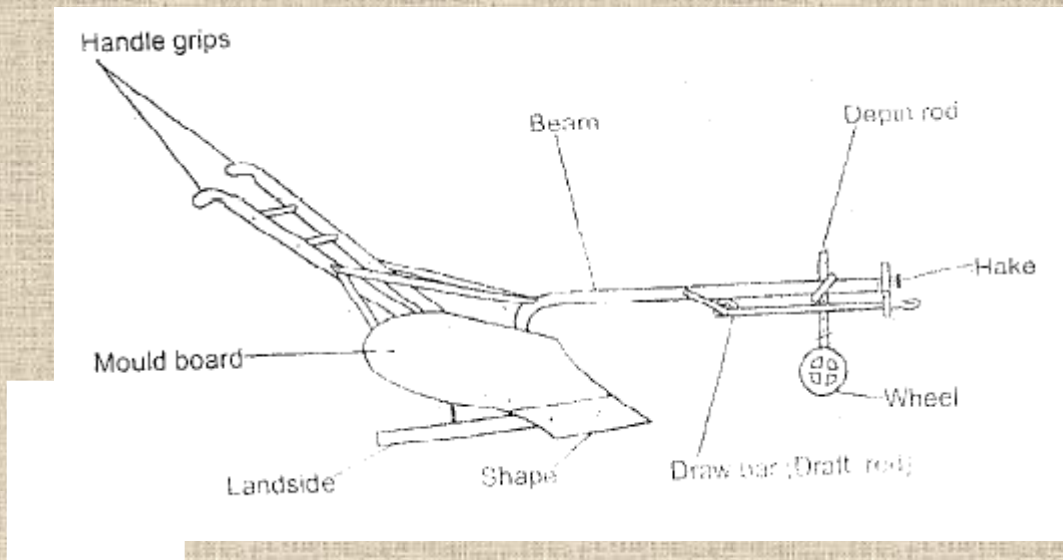
Question the maintenance required for the following implements.

Answer

- | | Implement | maintenance |
|-------|-----------------------|---|
| i). | cultivator | <ul style="list-style-type: none">- check shares / tines for wear and tear- tightened bolts and nuts- painting/ oiling / greasing- cleaning after use- storage in shade, replace worn out parts- lubrication |
| ii). | planter | <ul style="list-style-type: none">- lubrication- cleaning soil from coulters- painting / oiling/ greasing- cleaning after use- storage in shade, replace, worn out parts- lubrication |
| iii). | Harrows, disc harrows | <ul style="list-style-type: none">- lubrication of bearings- tighten bolts and nuts- paint/ oil/ grease when out of use to prevent rusting- after use, store in shed |
| iv). | Spike tooth harrow | <ul style="list-style-type: none">- check that pegs (teeth) are tightly clamped on frame- replace or sharpen damaged pegs- check on condition of points- sharpen points by grinding |

Question 21

With the aid of a diagram, identify the parts of a mould board plough.



Describe the functions of any three parts of the plough.

Answer

Part	Functions
Beam	holds other parts of the plough
Hake	fixing parts of the plough which are adjusted before and during ploughing
depth rod	adjusting depth of ploughing/ vertical adjustment
draft rod	pulling the plough / draw bar
link	linking the plough on to a chain pulled by oxen

wheel	maintain depth of the plough reduce resistance while ploughing/ steadying the plough
braces	stabilize plough
frog	where landside/ share/ mouldboard are attached
landside	stabilize plough
share mouldboard	cuts furrow slice/ penetrates soil turning furrow slice/ burying vegetation
hitch assembly	adjusting depth/ width of ploughing links plough to chain
handles	for operator to control plough
clamp	holds wheel arms to beams
wheel arms	holds the wheel
axle	connects wheel to arms/ where wheel turns
bolts and nuts	for joining different parts

AGRICULTURE PAPER 1

OCTOBER 1997

SECTION A

1A). Cultural weed control in crops involves the use of

- a). herbicides
- b). pesticides
- c). rotation
- d). tractors

B). Which gas is produced during respiration?

- a). carbon dioxide
- b). hydrogen
- c). nitrogen
- d). oxygen

C). Which of the following is most likely to give satisfactory control of nematodes?

- a). crop rotation
- b). contact pesticides
- c). natural enemies
- d). systemic fungicide

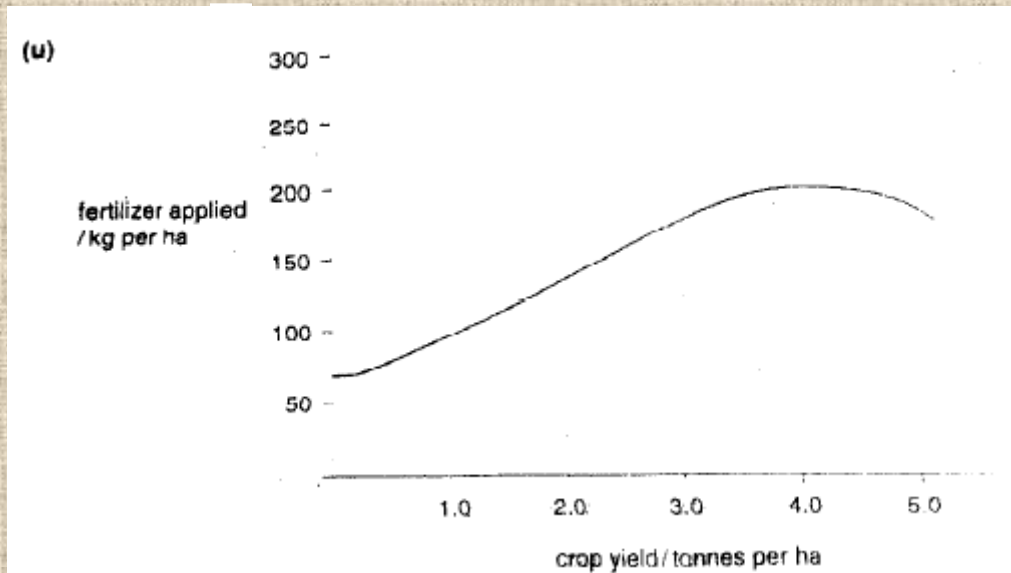
D). Commercial Agriculture has developed through the following stages:

- a). gathering, shifting, rotation
 - b). rotation, gathering, shifting
 - c). rotation, shifting, gathering
 - d). shifting, gathering, rotation
- E). The period when a female animal accepts a male during mating is called
- a). fertilisation
 - b). gestation
 - c). oestrus
 - d). service
- F). Iron fencing require treatment to protect them against
- a). rodents
 - b). rotting
 - c). rusting
 - d). termites
- G). What is the best soil material to fill a core trench of an earth dam?
- a). clay
 - b). gravel
 - c). loam
 - d). sand
- H). New shoots developing from a tree stump are called
- a). Branches
 - b). Coppices
 - c). Stolons
 - d). Suckers
- I). The most suitable farming activity in the low rainfall areas is
- a). dairy farming
 - b). forestry
 - c). poultry farming
 - d). ranching

- J). Which of the following is easily lost from the soil by leaching?
- a). magnesium
 - b). nitrogen
 - c). phosphorous
 - d). sulphur
- K). Biological control of pests can be done by
- a). flooding with water
 - b). introducing natural enemies
 - c). removing affected plants
 - d). spraying organic chemicals
- L). Which is not a reason for ploughing?
- a). aeration of soil
 - b). exposing pests in the soil
 - c). preparation of fine tilth
 - d). turning the soil.
- M). In a pen for small livestock, each animal should have 0.3m^2 of space. How many animals should be kept in a pen measuring $9\text{m} \times 4\text{m}$?
- a). 12
 - b). 36
 - c). 81
 - d). 120
- N). Which of the following conditions increases water loss in plants?
- a). lower humidity
 - b). lower temperature
 - c). reduced light intensity
 - d). reduced wind movement
- O). Agriculture is important because it
- a). increases the country's foreign debt
 - b). lowers the national economy
 - c). provides industrial raw material

- d). reduces trade between countries
- P). The formation of a soil pan in arable lands can be prevented if the plough depth is
- a). deep
 - b). even
 - c). shallow
 - d). varied
- Q). Which is the correct order to describe the sizes of soil particles in descending order of size?
- a). sand, Gravel, clay, silt
 - b). clay, silt, sand, gravel
 - c). gravel, sand, silt, clay
 - d). silt, clay, gravel, sand
- R). Hygroscopic moisture
- a). contains no dissolved minerals
 - b). is called free water
 - c). is easily used by plant roots
 - d). is found in dry soils
- S). A building plan shows
- a). cost
 - b). dimensions
 - c). location
 - d). strength
- T). Which of the following circumstances is an uncertainty
- a). accidents to employees
 - b). crop yields
 - c). farmer's health
 - d). technological change

U).



The graph above is used in farm economics to show

- a). demand curve
- b). diminishing returns
- c). gross margin
- d). supply curve

V). Which is a routine maintenance practice for a pressure pump?

- a). greasing
- b). painting
- c). sharpening
- d). welding

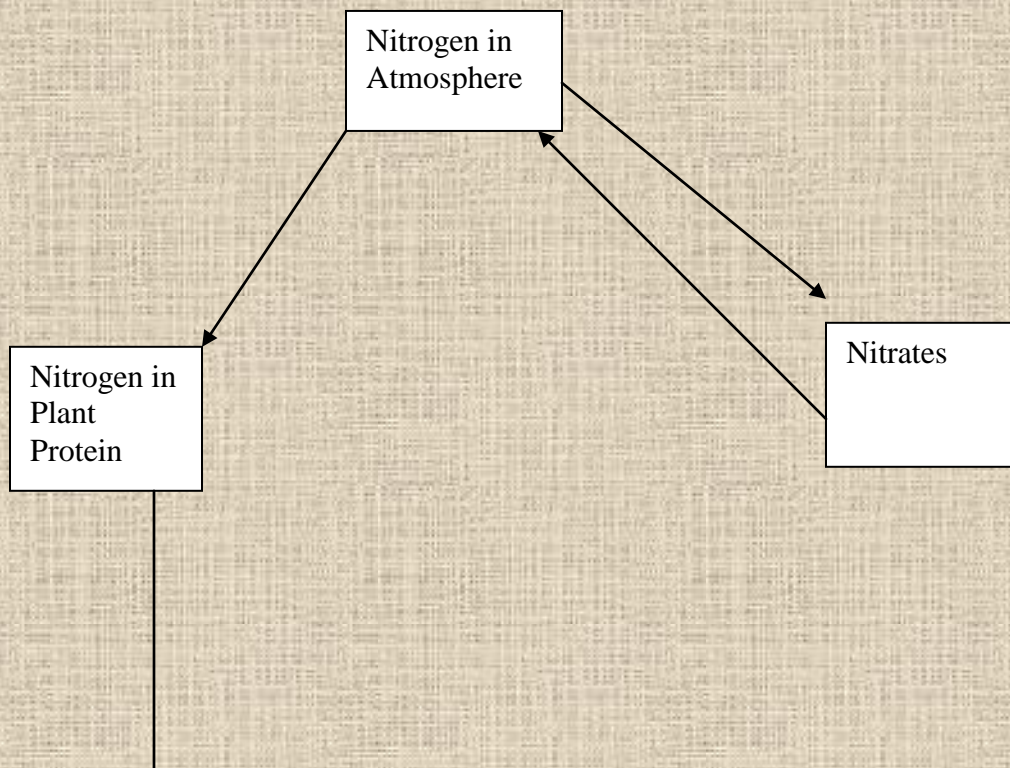
- W). Which list contains only ruminant animals?
- a). cattle, goats, pigs
 - b). cattle, goats, sheep
 - c). goats, pigs, sheep
 - d). goats, horses, sheep
- X). Which term refers to the number of animals grazing per unit area?
- a). carrying capacity
 - b). overstocking
 - c). rotational grazing
 - d). stocking rate
- Y). The colour indicating a pesticide with the highest toxicity is
- a). green
 - b). orange
 - c). purple
 - d). red

Section B

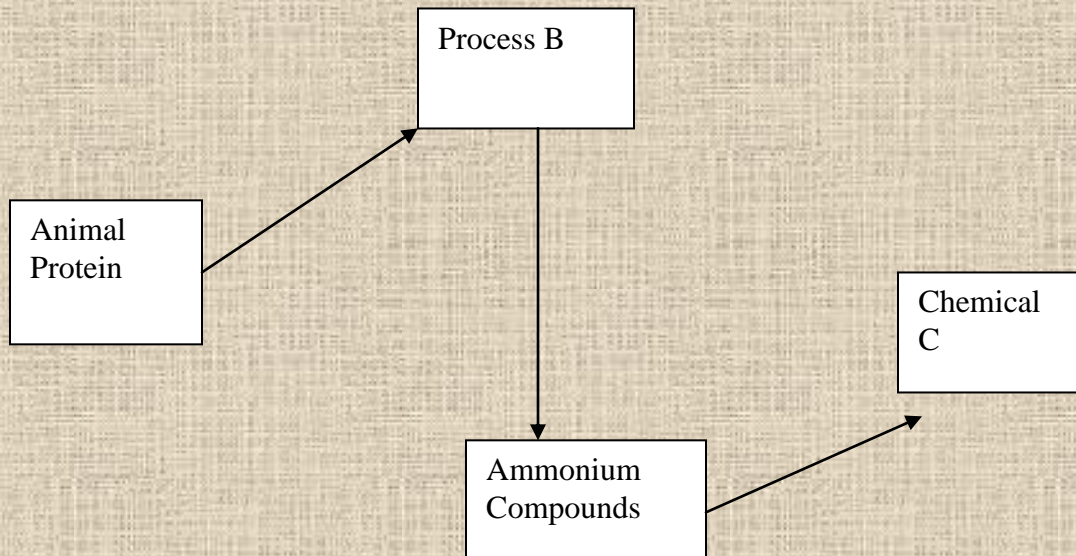
- 2a). State four ways in which plant nutrients may be lost from the soil. (4)
- b). Explain how each of the following will reduce crop production
- i). Strong winds
 - ii). Low rainfall
 - iii). High temperature
- 3a). List four ways by which pastures can be improved (4)
- b). State four characteristics of a flower which show that it is normally pollinated by wind. (4)

- 4). Explain what is meant by the following terms.
- i). infectious disease
 - ii). Field capacity
 - iii). Catch cropping
 - iv). Liabilities
 - v). Zero grazing
- 5). What routine maintenance is necessary on
- a). a saw?
 - b). a sprayer?
 - c). a wheel barrow?
- 6a). Name one fungal disease which is harmful to a named farm crop.
- b). State how the fungus attacks the crop plant. (2)
- c). Describe the symptoms of the fungal disease. (2)
- d). Name two ways of preventing fungal attack on crops. (2)

- 7). Fig 2 represents the nitrogen cycle.



Process A



Study the figure and answer the following questions.

- a). Name the process A
 - b). Name the process B
 - c). Name the chemical C
 - d). On the diagram, label the arrow which represents lightning with an L.
 - e). Which group of plants have roots containing nitrogen fixing bacteria.
- 8a). State four reasons why wire fencing is preferring to a hedge in an area where livestock is kept. (4)
- b). Name the organs where the following processes occur in ruminants.
1. cellulose digestion
 2. ovulation
 3. sperm production
 4. fertilisation
 5. implantation of fertilized egg
9. Explain the differences between
- a). respiration and photosynthesis (2)

- b). translocation and transpiration (2)
- c). pollination and fertilisation (2)

Section C

Option C – Crop Husbandry

- 10). Describe the cultivation of a named legume crop under the following headings.
 - a). Name of legume crop
 - b). Preparation of soil for planting (5)
 - c). Methods of planting (2)
 - d). Signs which indicate that the crop is ready for harvesting. (3)

- 11). For a named fruit or cash crop explain briefly.
 - a). three cultural methods of weed control

 - b). how a farmer can protect a named crop against
 - i). water logging
 - ii). wild animals
 - iii). Strong winds
 - iv). Trace element deficiency

- 12a). Outline the advantages and disadvantages of using commercial fertilizers.
- b). Describe the importance of keeping production and financial records in crop husbandry.

Option 2 – Livestock Husbandry

- 13a). Write short notes on the following
 - i). maintenance ration

- ii). notifiable diseases
- iii). Vaccines (6)

- b). Explain the advantages for a farmer exotic livestock. (4)

- 14. For a named viral disease, describe the disease under the following headings
 - a). cause (1)
 - b). method of transmission (2)
 - c). symptoms (3)
 - d). prevention (2)
 - e). treatment (2)

- 15a). Describe the composition of a balanced diet for a named farm animal. (5)

- b). Explain how supply and demand affect the marketing of animal products. (5)

Option 3 – horticulture and Lawn Management

- 16). Describe the establishment of a named lawn grass under the following sub- headings
 - a). land preparation
 - b). planting
 - c). weed control

- 17. Describe a named bedding plant under the following headings
 - a). method of propagation
 - b). time of planting
 - c). care after planting
 - d). control of pests and diseases

- 18a). Describe the stages in the growing of pot plants
- b). State four ways in which pot plants could be prepared for marketing.

Option 4 – Farm Structures and Machinery

19a). With the aid of a labeled diagram, describe a standard double yoke. (6)

b). Describe how each of the following helps in cooling an engine.

- i). water
- ii). water pump
- iii). Fan
- iv). Fan belt (4)

20a). Explain the factors considered in selecting a site for a farm building. (6)

b). Describe the necessary maintenance of a farm road. (4)

21a). What are the advantages of a plunge dip? (6)

b). Write short notes on the following:

- i). cambered road
- ii). mitre drain
- iii). Culvert
- iv). Invert (4)

Possible Answers

Agriculture Paper 1

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- 1a). C
- b). A
- c). A
- d). A
- e). C
- f). C
- g). A
- h). B
- i). D
- j). B
- k). B
- l). C
- m). D

- n). A
- o). C
- p). D
- q). C
- r). D
- s). b
- t). D
- u). B
- v). A
- w). B
- x). D
- y). C

Section B

Question 2

a). State four ways in which plant nutrients may be lost from the soil.

Answer:

- leaching
- absorption by plants, monoculture
- soil erosion – runoff
- burning crop residues
- oxidation, volitalisation

b). Explain how each of the following will reduce crop production.

- i). Strong winds
 - break branches
 - shed flowers, pollen, fruit leaves

- affects photosynthesis
- reduces yield and quality

ii). Low rainfall

- causes drying, moisture stress
- plant food manufacture is reduced
- poor germination
- poor yield
- quality of produce is affected

iii). High temperatures

- transpiration rate is increased
- rate of evaporation rises
- plants wilt and die
- poor quality of produce and low yields

Question 3

a). List four ways by which pastures can be improved

- fencing
- rotational grazing, paddocks
- supplementary irrigation
- planting pasture legumes
- correct stocking rate
- planting palatable species
- controlling bush encroachment
- removal of noxious weeds

b). State four characteristics of a flower which show that it is normally pollinated by wind.

- small flowers
- no bright colours
- no scent
- no nectar
- large loose anthers
- plenty of pollen
- feathery stigma, stigma exposed
- male flowers at tip

Question 4

Explain what is meant by the following terms

- a). Infectious disease
 - spreads rapidly
 - Contagious

- b). Field Capacity
 - maximum amount of water held against gravity
 - moisture within air pockets

- c). Catch cropping
 - crops grown in between main crops
 - to catch pests and diseases
 - crops that are ploughed under

- d). Liabilities
 - items delivered but not yet paid for
 - amount owing

- e). Zero Grazing
 - animals penned
 - grass cut and carried to pen
 - animals not allowed to graze

Question 5

What routine maintenance is necessary on:

- a). a saw
 - sharpening
 - leveling
 - setting teeth
 - hanging on rack

- b). a sprayer
 - tightening bolts and nuts
 - renewing hoses
 - repairing old parts

- c). a wheel barrow
- greasing wheel axil
 - tightening bolts
 - cleaning, washing and painting

Question 6

- a). Name one fungal disease which is harmful to a named crop.

Name of fungal disease	crop affected
Early late blight	tomatoes
Powdery mildew	peas
Brown rust	beans
Dumping off	seedlings

- b). disease damage
- dumping off hyphae penetrates cells
 - downy mildew grow in tissue
 - rust interfere with physiological functions
 - e.g. photosynthesis
 - powdery mildew causes sports – wilting
 - soft rot stems soften causing death

- c). symptoms of the fungal disease
- dumping off to seedlings
 - seedlings fall over
 - wilting and death

Downy mildew of peas

- great / white furry growth on the surface of leaves
- stunted growth and death

Rust of beans

- khakhi brownish, deep brown patches on leaves
- stunted growth and death

Blight of tomatoes

- brown patches on the leaves
- death of leaves, reduced yield, rotting of fruits

Powdery Mildew of tomatoes

- pods are covered with white powder
- white powder appears on leaves and stems
- stunted growth, rotting of fruits and death of the plants

Soft rot of Brassicas

- heads /stems soften
- heads/ stems rot
- bad smell of rotting leaves and stems resulting in death of plants

d). Name two ways of preventing fungal attack on crops

- seed dressing
- certified seed
- crop rotation
- resistant cultivars
- avoid water logging

Question 7

The Nitrogen Cycle

Process:

- A feeding/ eating ingestion
- B death, decay, rotting, decomposition and excretion
- C nitrates oxygen
- D note position of L on diagram
- E Legumes

Question 8

a). State four reasons why wire fencing is preferred to a hedge in an area where livestock is kept.

- wire is easily established / hedges take long to establish
- hedges eaten by animals; hedge is difficult to alter
- can be poisonous
- wire needs less maintenance
- wire easily altered to needs
- wire is not affected by drought

b). Name the organs where the following processes occur in ruminants

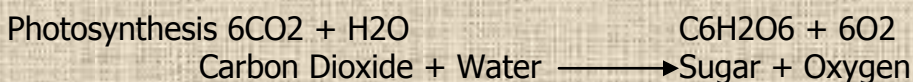
	Process	organ
1.	cellulose digestion	rumen
2.	ovulation	ovary
3.	sperm production	testis
4.	fertilisation	oviduct
5.	implantation of fertilized egg	uterus

Question 9

Explain the differences between

a). respiration and photosynthesis

- respiration: oxygen used to provide energy in cell
carbon dioxide and water are produced
- photosynthesis: carbon dioxide and water used to produce food and oxygen
in chloroplasts, respiration takes place in both animals and plants while
photosynthesis occurs in plants only.



Translocation and transpiration.

Answer:

Translocation : movement of food from one part to another.

Transpiration: loss of water from leaves to atmosphere.

Pollination and fertilisation

Answer:

Pollination: transfer of pollen from male flower to female flower.

Fertilisation : fusing of male sex gamete with female sex gamete to form a zygote.

Section C

Option 1 : Crop Husbandry

Question 10

Describe the cultivation of a named legume crop under the following headings.

a). Name of legume

- groundnuts

b). preparation for planting

- clearing / stumping burning and filling holes
- ploughing / digging / sub soiling to a depth 230 – 300mm
- discing / harrowing rolling and leveling
- fertilisation, manuring and liming

c). Methods of planting

- by hand or machine planters
- plant in rows of furrows spacing 600mm x 100mm
- timing/ plant in summer – November to February
- Depth – 25 to 75mm

d). Signs which indicate that the crop is ready for harvesting

- pods are dry, turn brown
- when pods are well filled
- brown leaves start falling
- 50 to 60% pods are mature

Question 11

For a named fruit or cash crop explain briefly.

a). three cultural methods of weed control

Answer

- | | | |
|-------|-------------------------|--|
| i). | crop rotation | bring different host
e.g. witch weed control |
| ii). | early planting | crops established before weeds germinate |
| iii). | Use of clean seed | seed free from weed seed |
| iv). | Mulching | prevents young seedlings of weeds
prevents weeds from growing |
| v). | flooding | suffocation of weeds |
| vi). | Placement of fertilizer | placed close to plants for maximum utilization |

b). How a farmer can protect a named crop against

- | | | |
|-------|--------------------------|--|
| i). | water logging | drainage |
| ii). | wild animals | fencing |
| iii). | Strong winds | wind breaks |
| iv). | Trace element deficiency | soil tests and correct fertilizers or liming |

Question 12

Outline the advantages and disadvantages of using commercial fertilizers.

i). advantages of using commercial fertilizers

- nutrients are in definite proportions
- fertilizers supply the required nutrients
- nutrients are readily available
- application is easy
- occupies less space in storage or less bulky
- improves quality of yield and yield

ii). disadvantages of commercial fertilizers

- expensive, need proper storage
- need skilled persons when applying
- cause plant damage if wrongly applied
- affect soil pH
- affect soil structure

b). Describe the importance of keeping production and financial records in crop husbandry

- tell whether making profit or loss
- facilitate management of activities carried out
- show history of agricultural production
- enable farmer to plan for future
- proof for one to borrow money from banks
- a tool used in selection of breeding stock
- help farmer to remember his debts or credits

Option 2 : Livestock Husbandry

Question 13

a). Write short notes on the following

i). Maintenance ration:

- amount of feed to keep an animal alive and healthy and perform normal functions without gaining / losing weight.

ii). Notifiable disease

- dangerous, spreads fast and mortality is high, reported to authorities, police veterinary services, soon after outbreak.

iii). Vaccines

- weakened/ mild form of disease injected into body of animal/ prevent disease/ build up immunity against attack

- b). Explain the advantage of keeping exotic livestock
- grow fast
 - fatten easily/ higher production
 - high feed conversion ration

Question 14

For a named virul disease, describe the disease under the headings

Name of disease – foot and mouth disease (F.M.D)

- | | |
|------------------|---|
| a). Cause | Virus |
| b). Transmission | contact with infected materials, food and saliva |
| c). Symptoms | blisters on hooves and mouth – there is excessive salivation , hooves later break away from coronet animals find it difficult to move |
| d). prevention | vaccinate cattle
quarantine affected animals
destroy affected stock
notify the veterinary office, agritex or police. |
| Treatment | nil |

Other viral diseases that affected livestock are swine fever, new castle and fowl Pox.

Question 15

Answer

- a). Describe the composition of a balanced diet of a named farm animal.

a balanced diet should have the following nutrients in their correct proportions

- carbohydrates
- proteins
- minerals
- vitamins
- water
- fats oils and roughage

- b). Explain how supply and demand affect the marketing of animal product

Factors to consider:

- season/ weather, pests / disease

- prices, transport, storage
- input costs; religious factors
- change in size of population
- employment / earnings; quality
- complementary products

Option 3 : Horticulture and Lawn Management

Question 16

Describe the establishment of a named lawn grass under the following headings.

a). Land Preparation

Answer:

Name of grass – Australian evergreen, Kikuyu or any lawn grass

- Plough or dig to a depth of 300mm
- Shake the soil to destroy weeds
- Rake or disc soil to a fine filth

b). Planting

- Plant in holes or furrows 100 – 150 mm deep
- row spacing – 200mm to 300mm
- leave 2 – 3 nodes sticking out of ground
- in row spacing – 100mm apart water after planting

c). Weed Control

- Remove weeds soon after transplanting grass
- Pull or use a garden fork
- Spray a selective herbicide

Question 17

Describe a named bedding plant under the following headings.

Name of plant – Sweet pea

a). Method of propagation

- use seed

- b). Time of planting
 - throughout the year if water for irrigation is available, after planting care
- c). After planting care
 - Cultivation to aerate the soil
 - Manuring – topdressing fertilizers, control pests and diseases
- d). Disease and pest control
 - use fungicides or nematicides to control pests and diseases – thin plants to reduce population therefore competition for light and nutrients.

Question 18

- a). Describe the stages in the growing of pot plants
 - soil is placed in pots, humus/ manure or fertilizer mixed with soil, a shoot is planted
 - watering ; application of top dressing/ fertilizer
 - mulching
- b). State four ways in which pot plants could be prepared for marketing

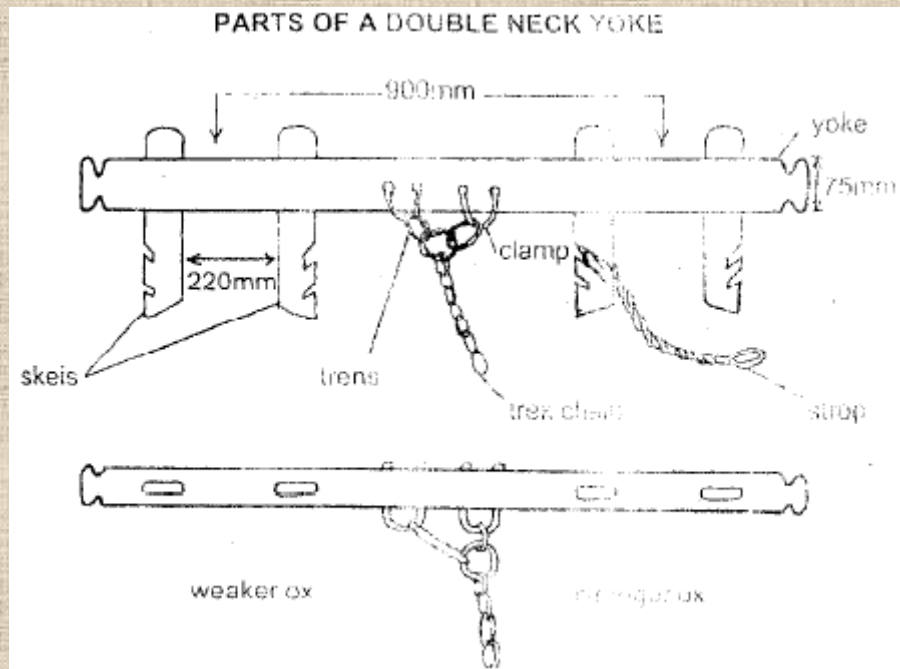
Answer

- select plants that are mature/ brightly / coloured
- no cracks in pots, no disease
- pests; wrap up pot in plastic paper
- grading, pricing, polishing and removal of dry leaves

Option 4 : Farm Structures and Machinery

Question 19

- a). With the aid of a labeled diagram describe a standard double neck yoke.



b). Describe how each of the following helps in cooling an engine

i). Water

- removes heat from the engine block

ii). Water pump

- circulates water through the engine/ water jackets

iii). Fan

- cools water in the radiator by drawing cold air

iv). Fanbelt

- a pulley or bell that rotates the fan

Question 20

a). Explain the factors considered in selecting a site for a farm building

- slope of the land
- wind direction
- distance from homestead
- size of building
- availability of water
- drainage of the soil

b). Describe the necessary maintenance of a farm road

- clearing mitre drains, culverts and inverts
- resurfacing
- strengthening bolsters
- keep shape/ camber shape of road to drain away runoff
- rolling

Question 21

a). What are the advantages of a plunge dip

- animals are completely immersed in water
- suitable for large herds
- easy to maintain
- dip can be used over and over
- can be operated by unskilled workers

b). Write short notes on the following

i). Cambered road

- road is raised above general ground level
- helps shed water quickly
- easily maintained and built

ii). Mitre drain

- spills water from road to waterway

- placed at one metre vertical intervals

iii). Culvert

- diverts water across road onto safe ground
- Build under the road

iv). Invert

- diverts water across the road on to safe ground, also called a dip, built across the road

AGRICULTURE PAPER 1

OCTOBER 1998

Section A

1A). An example of a variable cost is

- a). fencing
- b). fertilizers
- c). labour
- d). rent

B). Which tool is used for cultivating between young plants?

- a). dibber
- b). garden trowel
- c). hand fork
- d). spade

C). The vertical posts between standards in fencing are

- a). anchors
- b). droppers
- c). rails
- d). strainers

D). The fetus usually develops in the

- a). cervix
- b). fallopian tube
- c). ovary
- d). uterus

E). Diffusion of gases between the leaf and the atmosphere takes place through the

- a). chloroplast
- b). cuticle
- c). nucleus

- d). stoma
- F). The ploughing under of a crop at flowering stage is
- a). compost marking
 - b). trash farming
 - c). green manuring
 - d). trench digging
- G). Rotational grazing of pastures is described as
- a). extensive
 - b). tree – range
 - c). intensive
 - d). zero
- H). Positive geotropism means that plants roots grow
- a). from light
 - b). towards light
 - c). upwards
 - d). downwards
- I). If the recommended seed rate for a cereal crop is 150kg per hectare, the quantity required for a field of 4000m² is
- a). 15kg
 - b). 30kg
 - c). 60kg
 - d). 600kg
- J). Nitrogen deficiency in a crop shows
- a). brownish spots on leaves
 - b). poorly developed roots
 - c). purplish red colour of leaves
 - d). yellowing of leaves
- K). One advantage of indigenous trees over exotic is
- a). they mature earlier
 - b). they prevent soil erosion

- c). they produce straight poles
- d). they suit the environment

L). Why should water storage tanks be dark inside?

- a). to prevent algae
- b). to minimize evaporation
- c). to encourage cooling
- d). to reduce contamination

M). Most crops do not grow well under water logged conditions due to

- a). a low temperature
- b). high temperatures
- c). excessive aeration
- d). poor aeration

N). The total gross margin, less fixed costs is

- a). credit
- b). loss
- c). profit
- d). value

O). In Zimbabwe resettlement areas, land is held under

- a). communal ownership
- b). freehold land tenure
- c). leasehold land tenure
- d). state ownership

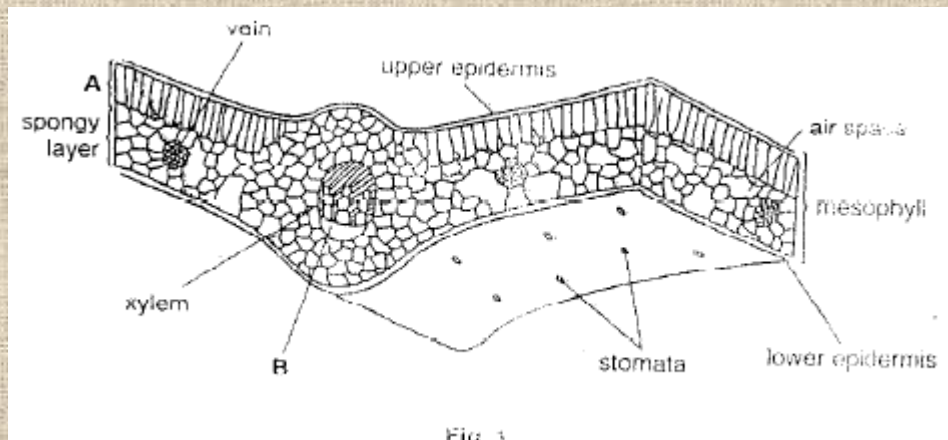
P). Market prices are likely to fall when the

- a). demand is highly and the supply is low.
- b). demand is low and supply is low
- c). supply is high and the demand is high
- d). supply is high and the demand is low

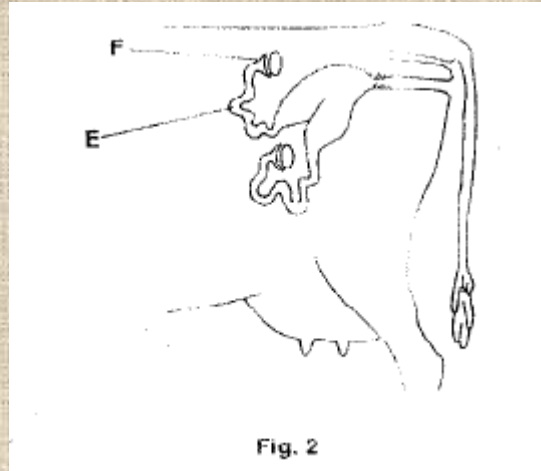
- Q). Chemical control of pests can be carried out by
- a). applying insecticides
 - b). burning the plants
 - c). introducing natural enemies
 - d). removing affected plants

Section B

- 2a). State three advantages of forests to the economy of Zimbabwe. (3)
- b). State the difference between:
- i). a soil pan and a soil cap (2)
 - ii). a clay soil and a sandy soil (2)
- 3a). State three ways in which a farmer can cause soil erosion. (3)
- b). State three advantages of using cuttings when propagating plants. (3)
- c). List four advantages of rotational grazing in pasture management. (4)
4. Fig 1 shows a vertical section through a leaf



- a). Name the parts labeled A and B.
- b). What are the functions of the following parts?
Xylem
Stomata
- 5a). State four methods that can be used to improve the structure of the soil.
- b). Calculate the amount of food consumed by an animal in four weeks if the daily consumption is 120g.
- c). State three reasons why mixing legumes and grass is good pasture management. (3)
- 6a). Define the following terms
 - i). stocking rate
 - ii). carrying capacity
- b). State four water collecting methods. (4)
- 7a). State two characteristics of a mature green manure crop. (2)
- b). State five problems associated with poor soil drainage. (5)
8. Fig 2 shows the female reproductive system of a ruminant.



- a). Label the following parts on the diagram
- vagina
 - cervix
 - Ovary
 - Uterus
- b). What are the functions of the parts labeled E and F?
- 9a). Explain how ring barking kills trees. (1)
- b). Why does excessive application of nitrogenous fertilizers cause plants to wilt.

Section C

Option 1 – Crop Husbandry

- 10a). For a named legume crop, describe the operations that are carried out from harvesting to marketing. (6)
- b). Explain the difference between selective and non- selective herbicides. (4)
- 11a). Describe the advantages and disadvantages of

- i). mechanical weed control (4)
- ii). cultural weed control (4)

- b). State any two methods of applying fertilizers to crops. (2)

- 12a). List five causes of crop damage other than pests and diseases. (5)
- b). Explain how each one cause damage to crops. (5)

Option 2 – Livestock Husbandry

- 13. For a named farm animal describe
 - a). the sources and functions of carbohydrates and proteins in its ration. (6)
 - b). methods of disease control (4)

- 14a). For a named animal, explain the importance of keeping records. (5)
- b). Describe the preparation of a named animal product for marketing. (5)

- 15a). With the aid of a clearly labeled diagram, describe the life cycle of a named internal parasite for a named host.

- b). Explain why a farmer should know the life cycle of the parasite you have named. (3)

Option 3 – horticulture and lawn management

- 16a). State the reasons for growing flowers (3)

- b). For a named flowering shrub, describe its growing under the headings
 - i). time and method of planting (3)
 - ii). weeding (2)
 - iii). Control of pests (2)

- 17. Describe the importance of each of the following in lawn management.

- i). top dressing
- ii). watering
- iii). Preparation of soil

18a). Write short notes on

- i). pricking out (2)
- ii). hardening off (2)
- iii). Landscaping (2)

b). Using examples, describe the four methods of propagating flowers. (4)

Option 4 – Farm structures and machinery

19. With the aid of labeled diagrams, explain how you would construct a farm road. (10)

20a). Describe briefly the safety precautions in the handing and storage of liquid fuels. (4)

b). Describe the adjustments that can be made on a mould board plough and indicate what effect these adjustments have on the ploughing. (5)

21a). Explain the differences between a two stroke engine and a four stroke engine. (6)

b). Explain how a planter works. . (4)

POSSIBLE ANSWERS

PAPER 1, NOV 1998

- 1a). B
- b). C
- c). B
- d). D
- e). D
- f). C
- g). C
- h). D
- i). C
- j). D
- k). D
- l). A
- m). D
- n). C
- o). D
- p). D
- q). A
- r). C
- s). A
- t). B
- u). A
- v). C
- w). B
- x). D
- y). A

Question 2

a). State three advantages of forests to the economy of Zimbabwe

Answer

- foreign currency / cash returns / tourism / beautify land
- fuel / firewood
- medicines
- timber/ furniture/ building materials/ construction/ industry
- provides fruits/ food
- act as wind break/ prevent erosion
- pulp/ paper / resin/ rubber
- conducive to clouds / rain formation

b). State the differences between

i). soil pan and a soil cap

Soil Pan

- hard layer underground / below soil
- due to continuous ploughing to same depth

Soil Cap

- hard layer on soil surface / crusting due to rainfall.

iii). A clay soil and a sandy soil

- Clay: poorly aerated/ drained; high humus content
- difficult for plant roots to penetrate; cold soil/ takes time to warm
- difficult to cultivate
- has small particles/ fine particles; forms cracks when dry, compact particles, less leaching, absorbs water slowly
- high water holding capacity
- high plant nutrients

Sand: well aerated / drained

- easy penetration of roots
- easy to work/ does not stick
- nutrients easily leached, large particles
- poor water holding capacity
- little plant nutrients, little humus
- erodes easily
- doesn't form cracks when it dries
- particles loosely packed

Question 3

a). State three ways in which a farmer can cause soil erosion

- ploughing along slope
- stream bank cultivation; poor pasture management
- burn crop residue
- overstocking ; pulling sledges
- veld fires; cattle tracks / foot paths
- cutting trees indiscriminately
- monoculture

b). State three advantages of using cuttings when propagating crops

- identical off spring
- shorter period to mature
- contains enough food for young plant
- only way to multiply sterile plants

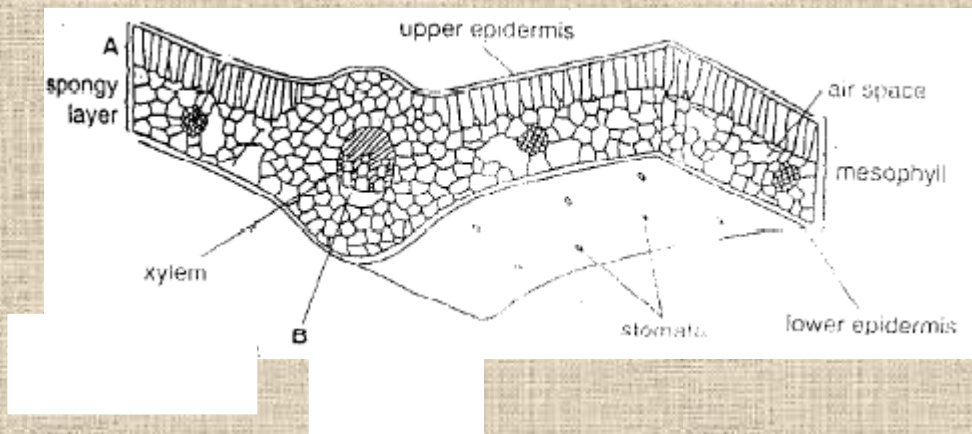
c). List four advantages of rotational grazing in pasture management.

- pest disease control
- less erosion
- grass recovers / rested
- reduces selective grazing
- grass builds reserves
- ensures enough food

- number of animals controlled

Question 4

Fig 1 shows a vertical section through a leaf.



- a). Name the parts labeled A and B

A palisade layer
B phloem cell

- b). What are the functions of the following parts

xylem cell, transports water and mineral salts from root to shoot
stomata for gaseous exchange, transpiration/ water loss

Question 5

a). State four methods that can be used to improve the structure of the soil.

Answer

- application of manure
- minimum tillage
- green manuring
- plough under crop residues
- liming
- leaving soil fallow

b). Calculate the amount of food consumed by an animal in four weeks if the daily consumption is 120g.

Answer

3360g / 3.36kg

c). State three reasons why mixing legumes and grass is good pasture management.

Answer

- supply nitrogen for plant growth
- improves palatability
- nutritious / protein supplied
- carbohydrates supplied for growth and production during long dry season

Question 6

a). Define the following terms

i). stocking rate

- number of animals per unit area of land/ number of animals actually grazing on the land

ii). carrying capacity

- maximum number of animals which can be grazed on the veld without doing any damage to that land
- number of hectares required by one livestock unit

b). State four water collecting methods

- dams, wells
- water harvesters
- weirs
- man made lakes
- storage tanks
- boreholes

Question 7

a). State two characteristics of a mature green crop

- leafy
- 10 to 15% flower
- early maturity
- quick to rot / succulent

b). State five problems associated with poor soil drainage

- low soil temperature

- poor germination
- denitrification
- poor microbial activity
- water logging
- poor / shallow root system
- difficult to cultivate
- late maturity of crops
- poor aeration
- leaching of plant nutrients

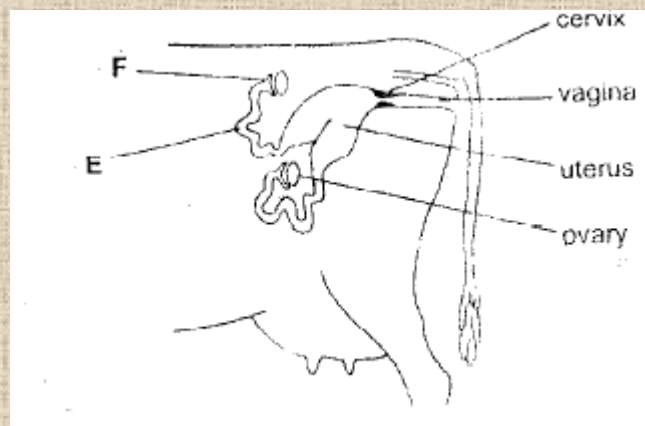
Question 8

Fig 2 shows the female reproductive system of a ruminant.
Label the following parts on the diagram:

Vagina
Cervix
Ovary
Uterus

Answer:

Reproductive system of a female ruminant animal.



Functions

- F Funnel ; receives the ova/ eggs
E Fallopian tube ; where fertilization takes place.

Question 9

a). Explain how ring barking kills trees

- bark with phloem cells is removed
- manufactured food is not translocated down to roots

b). Why does excessive application of nitrogenous fertilizer cause plants to wilt.

- high concentration of nitrogen in soil than in plant
- plasmolysis created / reversed osmosis
- fertilizer scorch / burns

Section C

Option 1: Crop Husbandry

Question 10:

a). For a named legume crop, describe the operations that are carried out from harvesting to marketing.

- name of legume: (Refer to syllabus)
- Lifting / digging/ picking, hands / groundnut lifter
- Curing on racks / drying; 2 – 6 weeks of drying
- Plucking / threshing beans, groundnuts stores best in pods
- Winnowing
- Shelling
- Protect from pests
- Bagging
- Store in a dry place, moisture below 9%
- Grading
- Weighing / 80 kg
- Beans / 50kg

- Sold to Grain Marketing Board/ National Foods / Lever Brothers

b). Explain the difference between selective and non selective herbicides.

Selective Kill only the weeds, without harming the crop, kill weeds within a crop

Non- selective Kill everything i.e both crops and weeds, use for pathways / construction sites / parking sites

Question 11

a). Describe the advantages and disadvantages of

i). Mechanical Weed Control

Advantages

- faster
- loosens the soil
- aeration improved
- infiltration improved

Disadvantages

- difficult to control perennial weeds
- labour intensive
- crops can be damaged
- destroys soil structure
- can lead to erosion
- cannot be used in wet places
- soil can be compacted

iii). Cultural

Advantages

- cheap
- less damage to crops

- less damage to soil

Disadvantages

- less effective
- takes a long time
- not economic

b). State any two methods of applying fertilizer

- spray/ foliar application
- banding / drilling
- broadcast; fertigation; hill placement

Question 12

a). List five causes of crop damage other than pests and diseases

- drought
- hail
- extreme temperatures
- water logging
- capping / crusting
- excessive use of fertilizers
- fire
- weeds
- frost
- flooding
- wind
- nutritional deficiency

b). Explain how each one causes damage to crops

- drought – plants wilt/ dry
- hail – tear / breaks/ crops

- water logging – suffocation of plants / stunted growth affect microbial activity
- capping – affects infiltration of water
 - affects germination
 - affects aeration
- fire – destroys crops
- wind – encourages evaporation/ transpiration – breaks plants/ crops / lodging of crops
- Nutritional deficiency – retards growth of plants

Option 2 : Livestock Husbandry

Question 13

a). For a named farm animal describe the sources and functions of carbohydrates and proteins in the ration.

- Pig / cattle/ sheep/ goats/ pigeons/ fish/ geese/ turkeys/ bees

i). carbohydrate sources

- plants especially cereal grains; silage; molasses, hay

Functions

- energy production, respiration
- maintain body temperature
- fat production
- growth
- physical activity
- reproduction
- lactation

ii). protein sources:

- plants, legumes e.g. beans
- sunhemp/ style
- cotton seed cake
- groundnut cake
- soya bean / field beans/ coupeas, velvet beans
- Lucerne hay/ meal

Animal sources

- Fish meal

- Meat / bone meal
- Milk products
- Blood meal

Functions:

- formation of muscles
- production of milk
- eggs/ wool/ meat, repair
- worn out tissues
- production of enzymes / digestive juices, growth

b). Methods of disease control

- control of vectors / treatment, control movement
- isolation / quarantine, eliminate carriers
- vaccination / inoculation
- control parasites
- proper housing / enough space / ventilation
- suitable diet / clean food/ clean water
- hygiene / disinfection, report outbreak of notifiable diseases
- destroy infected animals

Question 14

For a named animal explain the importance of keeping records.

a). Name of animal (Refer to syllabus)

- enable culling
- selection of breeding stock
- production / milk
- when to mate / wean
- when animal gives birth
- whether one is making profit or loss
- assist in planning, to obtain loans

b). Describe the preparation of a names animal product for marketing

Answer:

Meat	Milk	Wool	Hides and Skins
<ul style="list-style-type: none"> - Slaughter - Bleeding - Flaying - Removal of offals - Flashing with water - Inspection - Grading - Chilling/ refrigeration - Cutting; jointing; - Processing - Weighting - Salting - Packaging - Canning 	<ul style="list-style-type: none"> - Sieving - Cooling - Testing - Packing - Refrigeration - Quality control - Pasturising 	<ul style="list-style-type: none"> - Shearing - Cleaning - Drying - Weighing - Grading - Packing 	<ul style="list-style-type: none"> - Flaying / trimming - Salting - Fleshing - Washing - Grading

