

Centre Number	Candidate Number	Candidate Name
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NAMIBIA SENIOR SECONDARY CERTIFICATE

AGRICULTURAL SCIENCE ORDINARY LEVEL

6115/1

PAPER 1

2 hours

Marks 120

2022

Additional Material: Non-programmable calculator

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Candidates answer on the Question Paper in the spaces provided.
- Write your Centre Number, Candidate Number and Name in the spaces at the top of this page.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams, graphs or rough working.
- Do not use correction fluid.
- You may use a non-programmable calculator.
- Do not write in the margin *For Examiner's Use*.
- The number of marks is given in brackets [] at the end of each question or part question.

Section A

- Answer **all** questions.

Section B

- Answer any **two** questions.
- Write your answers on the answer sheets at the back of the booklet.

For Examiner's Use	
Section A	
1	
2	
3	
4	
5	
6	
7	
8	
Section B	
.....	
.....	
Total	

Marker	
Checker	

This document consists of **20** printed pages.



Republic of Namibia
MINISTRY OF EDUCATION, ARTS AND CULTURE

SECTION A

Answer **all** questions in the spaces provided.

1 (a) Fig. 1.1 shows an irrigation system.

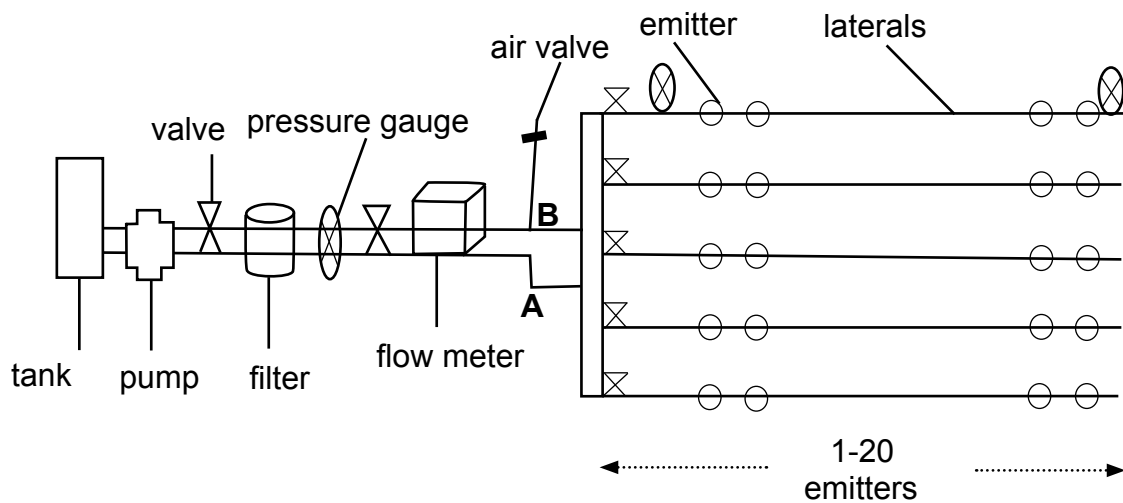


Fig. 1.1

(i) Identify the irrigation system shown in Fig. 1.1.

..... [1]

(ii) Which agricultural personnel is responsible for the installation of irrigation systems such as the one in Fig. 1.1?

- A** Agricultural engineer
- B** Agricultural extension officer
- C** Agricultural mechanic
- D** Farm manager

Answer **A, B, C** or **D** [1]

(iii) Discuss how irrigation increases plant growth.

..... [3]

(iv) Suggest suitable fittings to be used as jointing pieces at **A** and **B** on Fig. 1.1.

A.....

B..... [2]

(b) Apart from irrigation, suggest **two** other uses of underground water sources.

1.....

2.....

[2]

(c) Fig. 1.2 shows the number of people living with HIV in Namibia between 1990 and 2009.

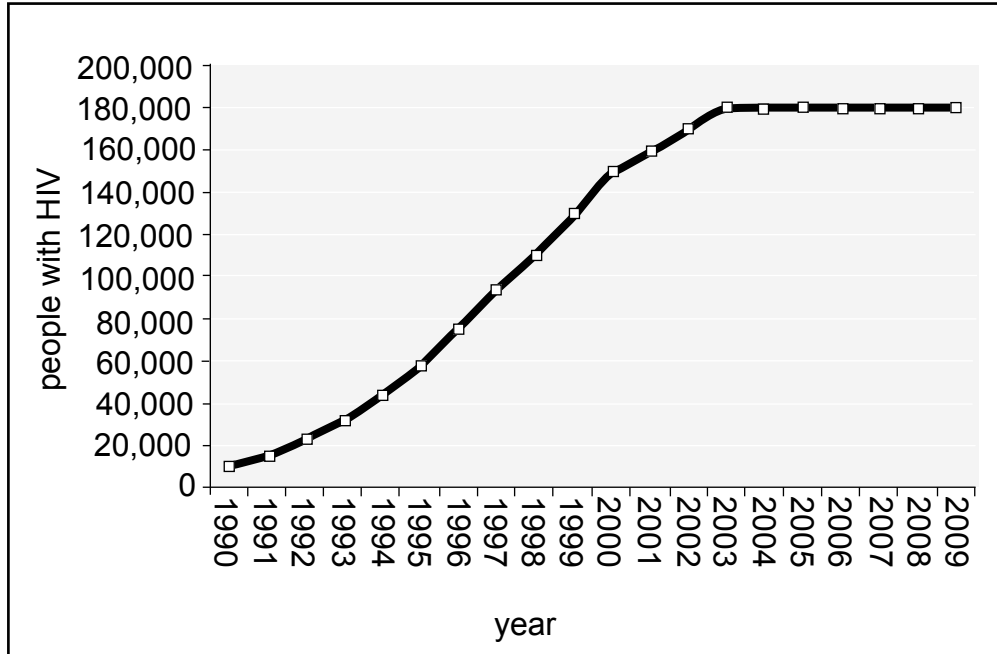


Fig. 1.2

By how much did the number of people infected with HIV increase between 1990 and 2003?

- A** 5 000
- B** 10 000
- C** 170 000
- D** 180 000

Answer **A**, **B**, **C** or **D**

[1]

(d) Explain leasehold as a method of land tenure system in Namibia.

.....

.....

.....

[2]

[12]

- 2 Fig. 2.1 shows an experiment in which 150 g of river and dry garden soil were added into funnels. Both funnels were placed on the measuring cylinders and 100 cm³ of tap water was added in both funnels at the same time.

After 2 minutes, the funnels were removed.

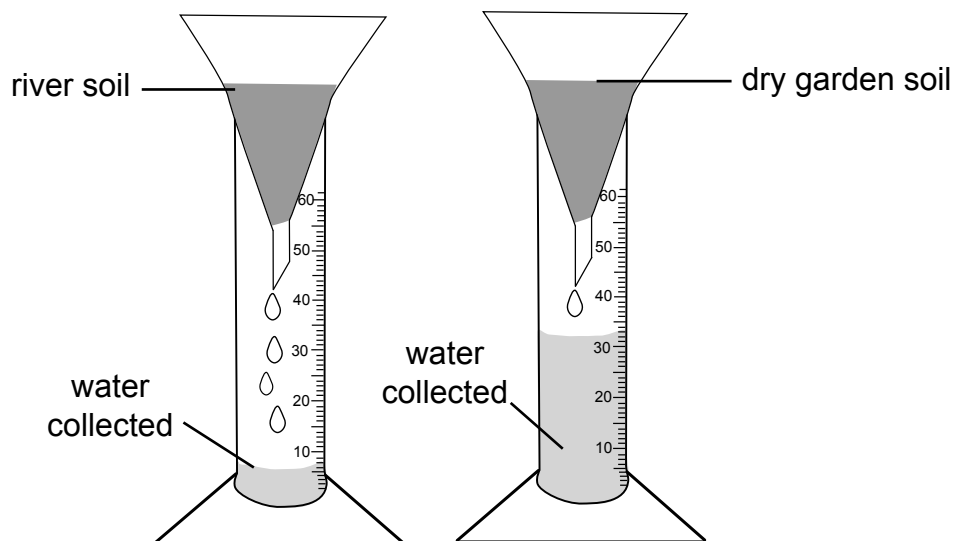


Fig. 2.1

- (a) (i) Complete Table 2.1 by filling in the missing information.

Table 2.1

soil sample	volume of water added/cm ³	volume of water collected after 2 minutes/cm ³	volume of water retained/cm ³
river soil	100 cm ³		
dry garden soil	100 cm ³		

[2]

- (ii) Suggest, with a reason, the soil type collected from the river.

.....

.....

[2]

- (iii) Apart from water retention, suggest **two** other features of soil that can be tested using the apparatus in Fig. 2.1.

1

2

[2]

(b) Fig. 2.2 shows the nitrogen cycle.

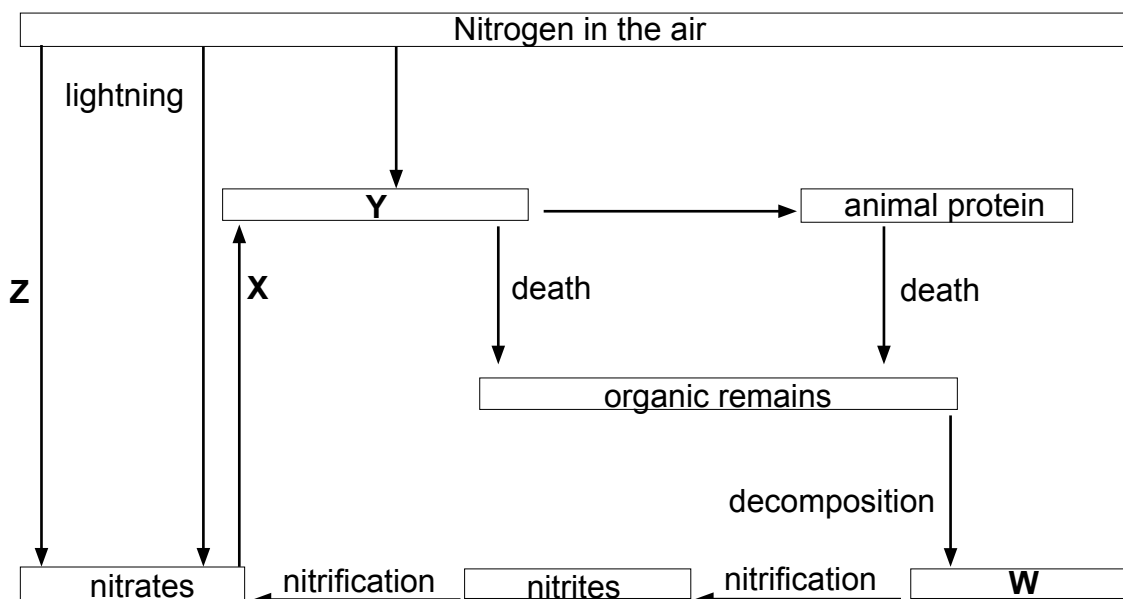


Fig. 2.2

(i) Name **W**, **X**, **Y** and **Z** in Fig. 2.2.

W.....

X.....

Y.....

Z.....

[4]

(ii) Which reaction describes nitrogen fixation?

- A** oxidation of ammonia to nitrates
- B** reduction of atmospheric nitrogen to ammonia
- C** oxidation of nitrites to atmospheric nitrogen
- D** reduction of nitrates to nitrites

Answer **A**, **B**, **C** or **D**

[1]

(iii) Explain how the availability of nitrogen in the soil is negatively affected by rainfall.

.....

.....

[2]

[13]

- 3 (a) Fig. 3.1 shows an apparatus that was set up to investigate a physiological process in plants. The apparatus was kept in the sunlight for 8 hours.

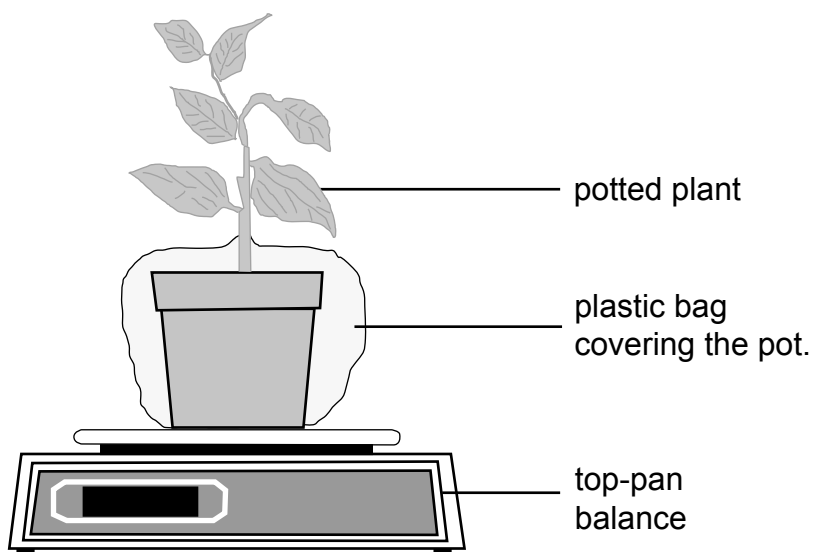


Fig. 3.1

The mass of the plant and its pot was measured after every two hours and the results were recorded in Table 3.1.

Table 3.1

time	mass loss/g
8:00	0.2
10:00	0.4
12:00	0.6
14:00	0.8
16:00	1.0

- (i) Name the process being investigated in Fig. 3.1.

..... [1]

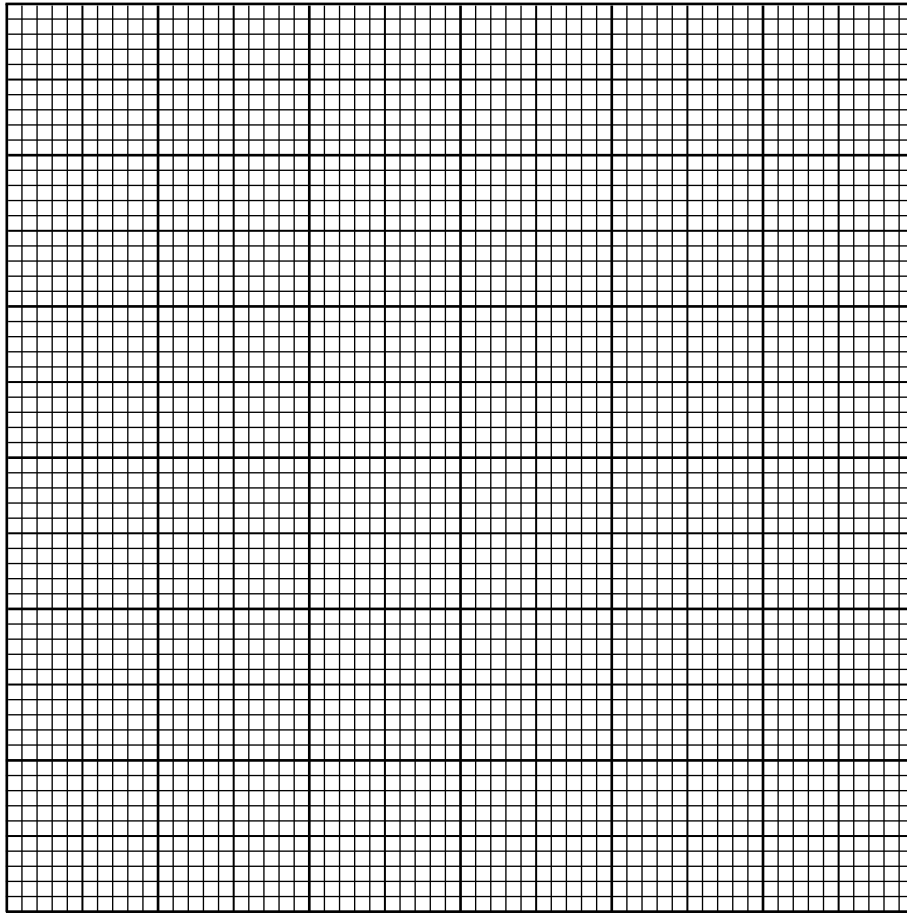
- (ii) Suggest an explanation why the pot was covered with a plastic bag.

..... [1]

- (iii) Suggest **two** ways in which this process is beneficial to plants.

1 [2]
2

- (b) (i) Plot the graph for the information in Table 3.1 in the grid below. Include an appropriate title.



[5]

- (ii) Describe the relationship between the time of the day and mass loss in the plant.

.....

.....

[1]

- (iii) Name **two** factors that can influence the process being investigated in Fig. 3.1.

1

2

[2]

[12]

4 (a) Fig. 4.1 shows a root hair cell.

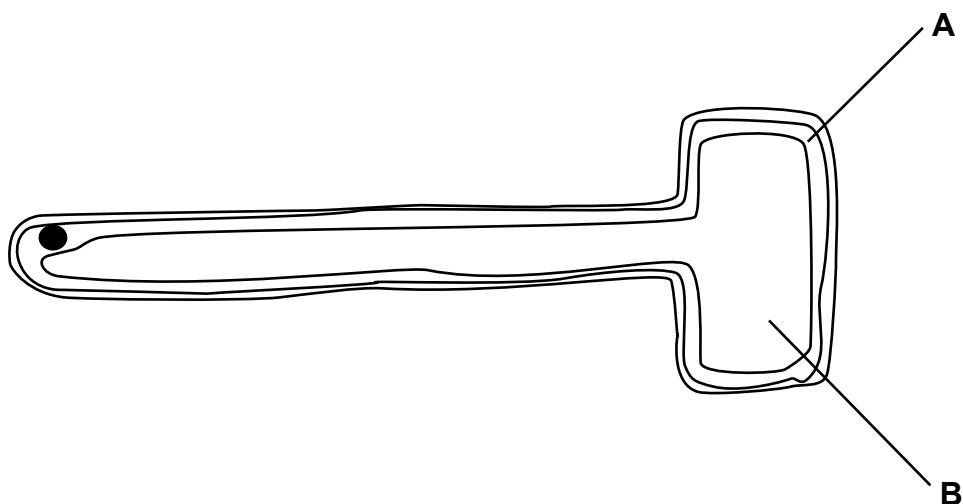


Fig. 4.1

(i) Name structures **A** and **B**.

A.....

B.....

[2]

(ii) Explain what makes the root hair cell suitable for absorption of water and mineral salts.

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

[2]

(iii) What happens if the plant cell takes in the maximum amount of water possible?

A cell becomes flaccid

B cell becomes turgid

C cell bursts and dies

D cell wilts and dies

Answer **A**, **B**, **C** or **D**

[1]

(b) Fig. 4.2 shows a root hair infested by a nematode.

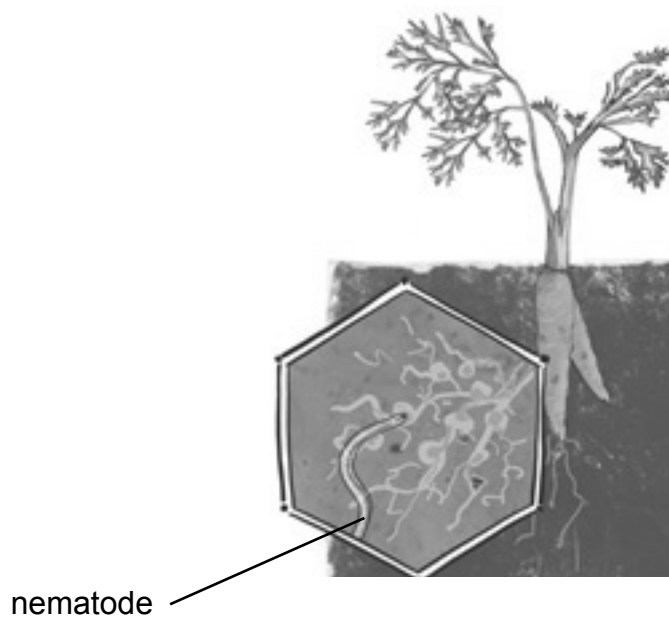


Fig. 4.2

- (i) What type of pest is a nematode?
 [1]
- (ii) Outline **three** ways how nematodes can damage plants.
 1
 2
 3 [3]
- (iii) Suggest **two** effective methods to control nematodes.
 1
 2 [2]
- [11]

5 (a) Namibia exports beef to Asian countries through the Meat Corporation of Namibia (MEATCO).

(i) Name an Asian country that imports beef from Namibia.

..... [1]

(ii) Outline **three** requirements that the Meat Corporation of Namibia (MEATCO) must meet when exporting beef to international markets.

1

.....

2

.....

3

..... [3]

(iii) Suggest **two** contributions of beef cattle farming, other than export, to the Namibian economy.

1

2 [2]

(b) What is meant by artificial selection in livestock breeding?

.....

..... [2]

(c) Suggest the benefits of cross breeding in cattle farming.

.....

.....

.....

.....

.....

..... [3]

(d) Which term refers to the physical characteristics of an organism?

A heterozygous

B homozygous

C genotype

D phenotype

Answer **A, B, C** or **D** [1]

[12]

- 6 (a) Fig. 6.1 shows the revenue generated from conservancy and community forest over five years in Namibia.

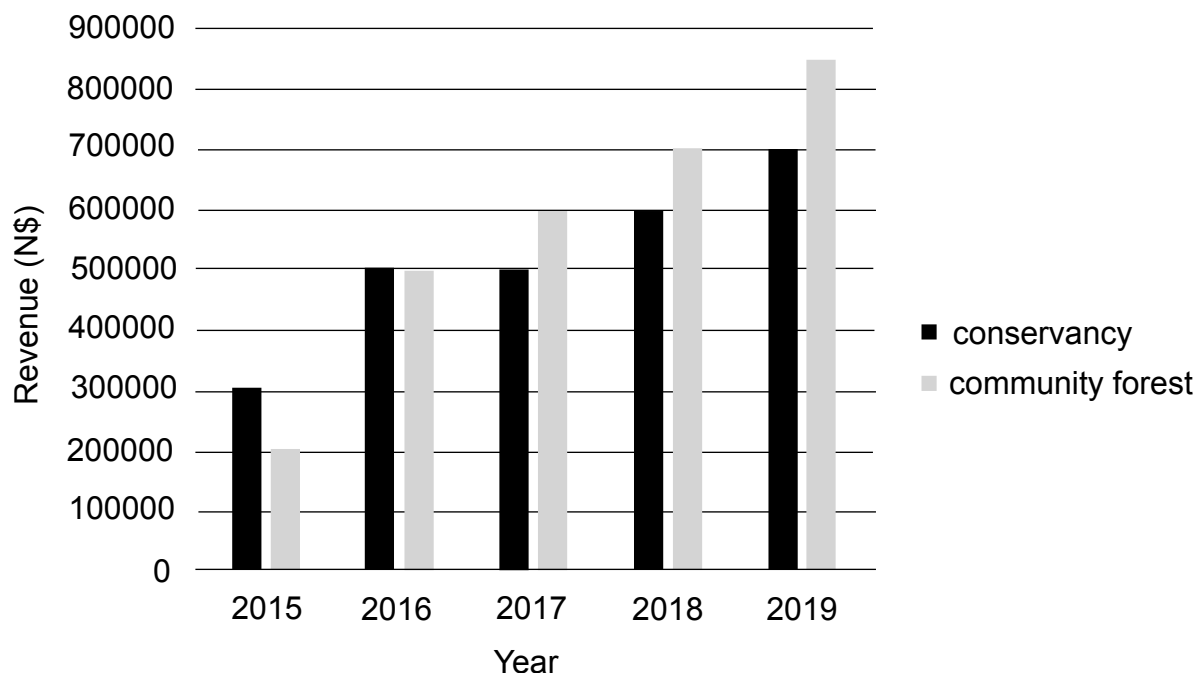


Fig. 6.1

- (i) How much revenue was generated from community forest in 2019?
..... [1]
- (ii) Calculate the average revenue from community forest from 2017 to 2019.
Show your working.

[2]

- (iii) Suggest with a reason, what is likely to happen to the revenue generated from conservancy in 2025.

.....
.....
..... [2]

- (b) Which communal conservancy was among the first four conservancies gazzeted in 1998?

- A //Gamaseb
B King Nehale
C Kwandu
D Salambala

Answer A, B, C or D [1]

- (c) Fig. 6.2 shows one of the benefits that community members enjoy from a well-managed community forest.



Fig. 6.2

- (i) Name **four** other benefits that the community can enjoy from a community forest.

1

.....

2

.....

3

.....

4

.....

[4]

- (ii) Outline the requirements by law for people in community to apply for permits to use protected forest in their local area.

.....

.....

.....

.....

[2]

- (iii) Which recognized body should give consent to the Ministry of Environment and Tourism to approve the establishment of community forest?

- A** the community members
- B** the constituency councillors
- C** the headman/woman
- D** the traditional authority

Answer **A, B, C** or **D**

[1]

[13]

- 7 (a) Fig. 7.1 shows parts of the stock fences **A** and **B**.

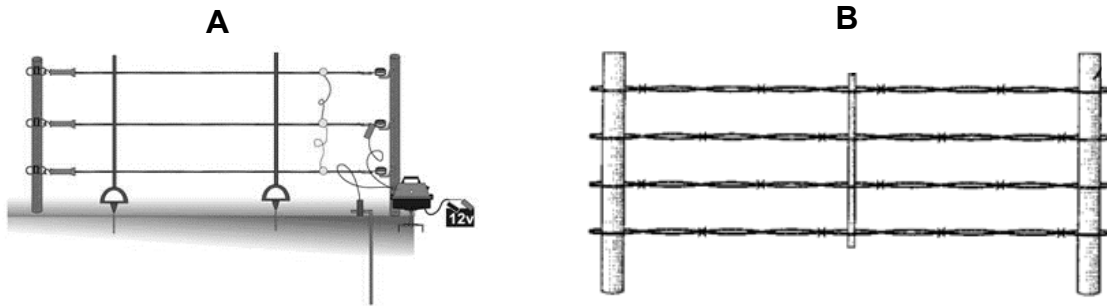


Fig. 7.1

- (i) Name fences **A** and **B** in Fig. 7.1.

A.....

B.....

[2]

- (ii) Suggest, with a reason, which fence poses a greater threat to the livestock by wounding.

.....

.....

.....

[2]

- (iii) Name **two** tools that can be used to construct fence **B**.

1

2

[2]

- (b) Which implement/tool is used to break large soil clods on large scale farms?

- A** disc plough
- B** garden fork
- C** harrow
- D** rake

Answer **A, B, C** or **D**

[1]

[7]

- 8 (a) Below is the list of expected income and expenditure of a farmer's layer farming enterprise.

Casual labour	N\$ 500.00
Sale of eggs	N\$ 5000.00
Vaccine	N\$ 2000.00
Day old chick cost	N\$ 2000.50
Sale of manure	N\$ 500.30
Sale of 100 layers	N\$ 3000.00

- (i) Use the information listed above to place them in the correct side of the budget on Table 8.1.

Table 8.1

Expected income	N\$	Expenditure	N\$
Total		Total	

[2]

- (ii) Work out the **total** expected income and **total** expenditure in Table 8.1.

[2]

- (iii) Name **two** variable costs from the list.

1

2

[2]

- (iv) The farmer has 1000 layers. The number of eggs laid in November (30 day period) is 21 000. What is the laying percentage? Show your working.

[3]

(b) Fig. 8.1 shows animal yield in relation to nutrients intake.

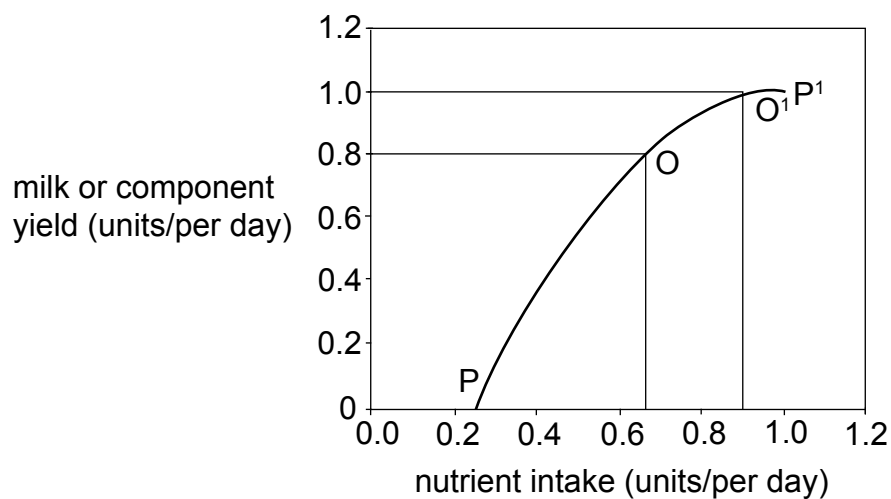


Fig. 8.1

Which principle in agricultural economics is represented in Fig. 8.1?

- A** demand
- B** diminishing return
- C** opportunity cost
- D** supply

Answer **A, B, C** or **D** [1]

[10]

SECTION B

Answer any **two** questions.

Write your answers on the answer sheets provided at the back of the booklet.

- 9** (a) Define *sustainable agriculture*. [2]
 (b) Describe **three** agricultural practices that are aimed at conserving water. [6]
 (c) Explain how the following environmental factors can negatively affect plant growth.
 (i) rainfall [3]
 (ii) wind [4]
[15]
- 10** (a) A farmer has white and red sweet potato cultivars that he can plant. He decides to choose only one cultivar, red sweet potato for planting.
 (i) Explain what is meant by the term *cultivar*. [2]
 (ii) Suggest why the farmer may choose one cultivar over the other. [4]
 (iii) Explain how sweet potato can be reproduced asexually. [4]
 (iv) Explain an opportunity cost to this farmer. [2]
 (b) Outline the importance of viable seeds. [3]
[15]
- 11** (a) Define *carrying capacity*. [2]
 (b) Explain the benefits of legumes species to the
 (i) pasture [2]
 (ii) livestock [2]
 (c) Outline the general characteristics of beef cattle in Namibia. [5]
 (d) Discuss how beef cattle are castrated non-surgically. [4]
[15]
- 12** (a) Explain what is meant by *notifiable diseases*. [2]
 (b) Discuss **one** disease found in cattle in Namibia. In your discussion, include:
 • the causative organism [1]
 • the symptoms [2]
 • the control measure [1]
 (c) Describe the process of absorption of nutrients in the alimentary canal of a ruminant. [4]
 (d) Draw and label fully the structure of the reproductive system of a named farm animal (not poultry). [5]
[15]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.

[illegible]

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dotted lines, providing a guide for letter height and placement. The lines are evenly spaced across the entire page, which is otherwise blank.

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