Centre Number	Candidate Number	Candidate Name

NAMIBIA SENIOR SECONDARY CERTIFICATE

BIOLOGY ORDINARY LEVEL

4322/3

PAPER 3 Applied Practical Skills

2 hours

Marks 60

2018

Additional Materials: Ruler

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*.

- Answer **all** questions.

- The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
Total	

Marker	
Checker	

This document consists of **11** printed pages and **1** blank page.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

[Turn over

BLANK PAGE

1 **(a)** Fig. 1.1 shows a light microscope. Name the parts of the light microscope labelled **A**, **B** and **C**.

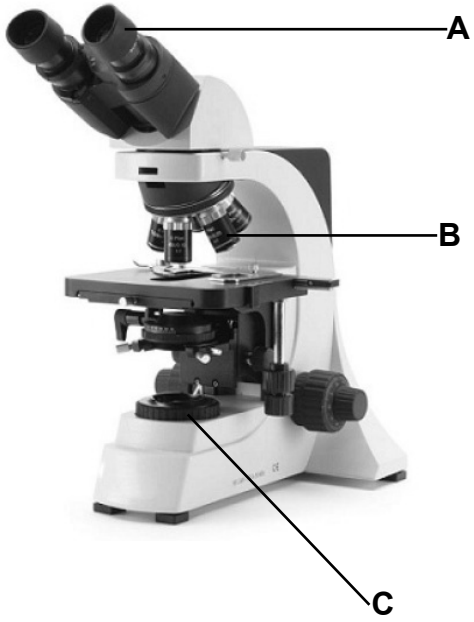


Fig. 1.1

A .....

B .....

C ..... [2]

(b) Fig. 1.2 shows how a microscope slide of onion tissue was prepared.

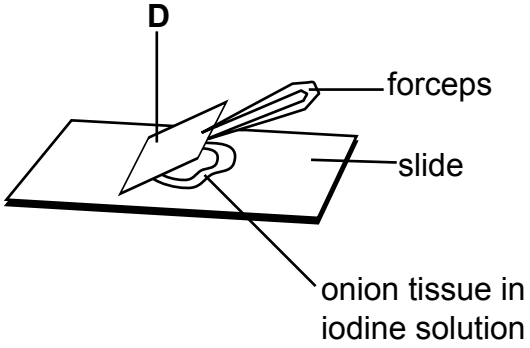


Fig. 1.2

(i) Name **D**.

..... [1]

(ii) Explain why the forceps were used to lower **D** when preparing a slide.

..... [1]

(iii) Explain why the layer of tissue needs to be thin.

.....

..... [1]

(iv) Explain why the onion tissue used is placed in the iodine solution.

.....

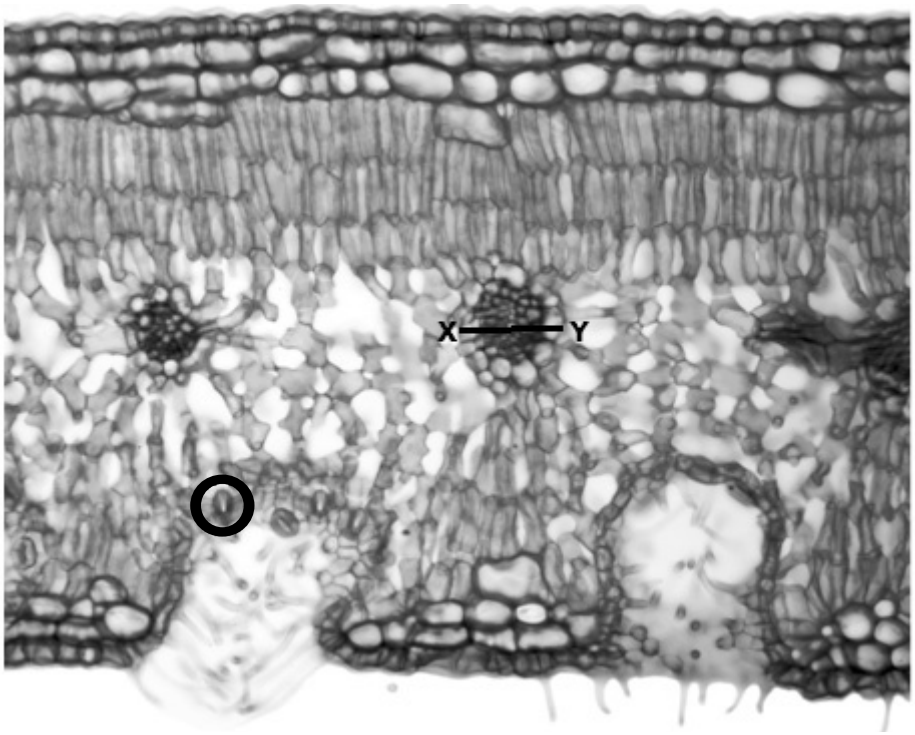
.....

.....

..... [2]

(c) Fig. 1.3 is a light micrograph of a section through a leaf of a xerophytic plant.

An area containing one of the plant's stomata is circled.



Magnification X60

Fig. 1.3

(i) List **three** adaptations, visible in Fig. 1.3, which are characteristic of xerophytic plants.

1 .....

2 .....

3 ..... [3]

For Examiner's Use

(ii) Calculate the diameter of the vascular bundle across the line **XY**.

Show your working and give your answer to the nearest 100 μm.

(1 cm = 1000 μm)

Answer ..... μm [2]

[12]

For Examiner's Use

2 Fig. 2.1 shows the appearance of a plant cell before and after it was immersed in distilled water for 30 minutes.

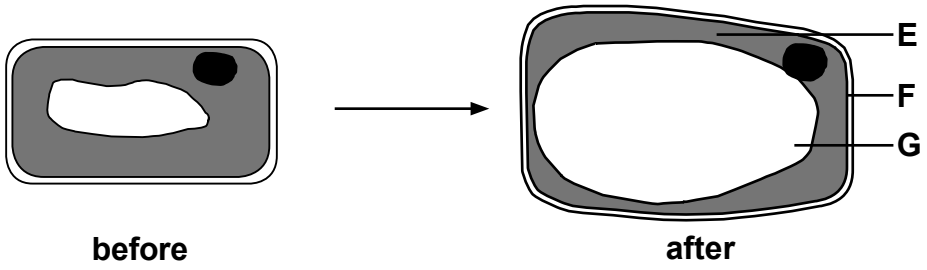


Fig. 2.1

(a) Give **three** reasons, evident from Fig. 2.1, that demonstrate that the cell was placed in distilled water.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(b) Identify the parts labelled **E**, **F** and **G**.

E .....

F .....

G ..... [3]

(c) Explain the process that has taken place in the plant cell when placed in the distilled water.

.....

.....

.....

.....

.....

.....

..... [3]

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(d) The plant cell labelled **before** in Fig. 2.1 was then placed in a 20% sucrose solution. In the space below, draw a diagram to show the appearance of this plant cell after 30 minutes in the sucrose solution.

[3]

[12]

3 **(a)** Complete the balanced equation for aerobic respiration.

$C_6H_{12}O_6 + 6O_2 \longrightarrow$ ..... + ... [1]

(b) Fig. 3.1 may be used to demonstrate that carbon dioxide is produced in aerobic respiration. Air is drawn through the apparatus by attaching it to a vacuum pump at **X**. A chemical is placed in flask **H** to remove carbon dioxide.

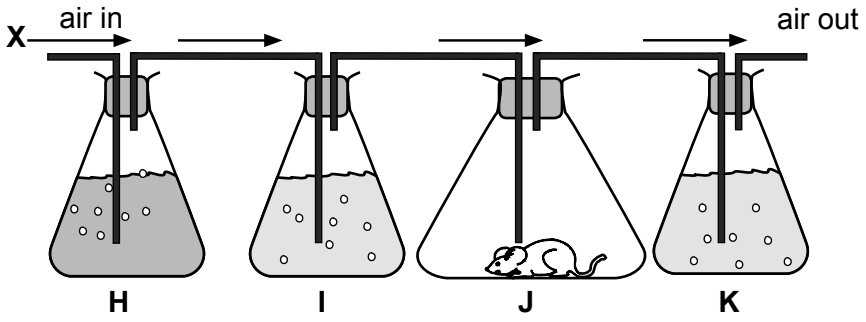

Fig. 3.1

(i) What is the purpose of removing carbon dioxide at **H**?

.....

..... [1]

(ii) Which chemical will be used to remove the carbon dioxide?

..... [1]

(iii) Limewater is put in flasks **I** and **K**.

Suggest a reason for putting it in each flask.

I .....

.....

K .....

..... [2]

(iv) A suitable control for this experiment will be the same apparatus, but with no mouse.

What is the purpose of a control in an experiment?

.....

..... [1]

(v) The experiment can be carried out using a plant instead of a mouse.
Flask **J** is covered with dark paper.
Explain the purpose of covering flask **J** with dark paper.

.....

.....

.....

..... [2]

(c) Fig. 3.2 shows the apparatus used to demonstrate anaerobic respiration in yeast. The glucose solution was boiled and cooled before adding the yeast.

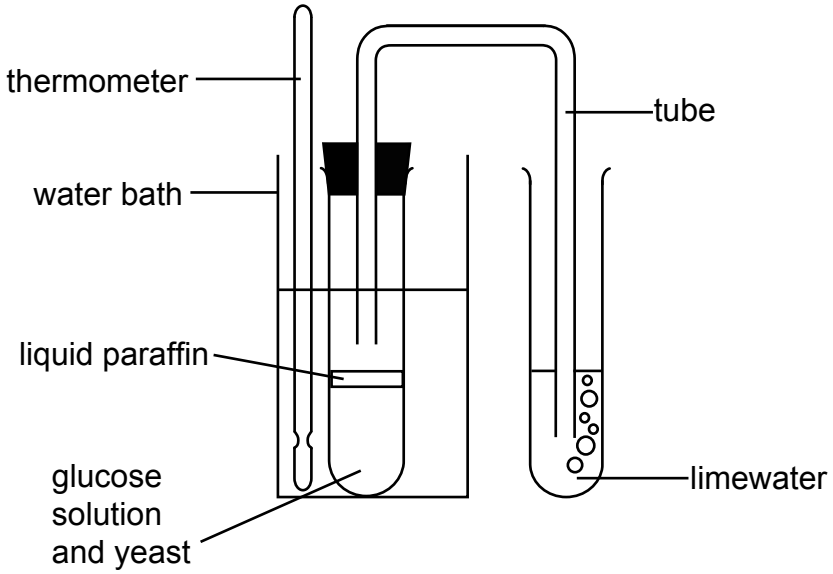

Fig. 3.2

(i) State why the glucose solution was boiled before adding the yeast.

..... [1]

(ii) State **one** reason for putting a layer of liquid paraffin on top of the glucose solution.

.....

..... [1]

(iii) A student set up a control experiment. She used the same apparatus but used yeast and boiled water only. Is this a suitable control?
Explain your answer.

.....

.....

.....

..... [2]

[12]

For Examiner's Use

4 Fig. 4.1 shows four groups of oat coleoptiles (stem tips of young seedlings) that were grown under different conditions.

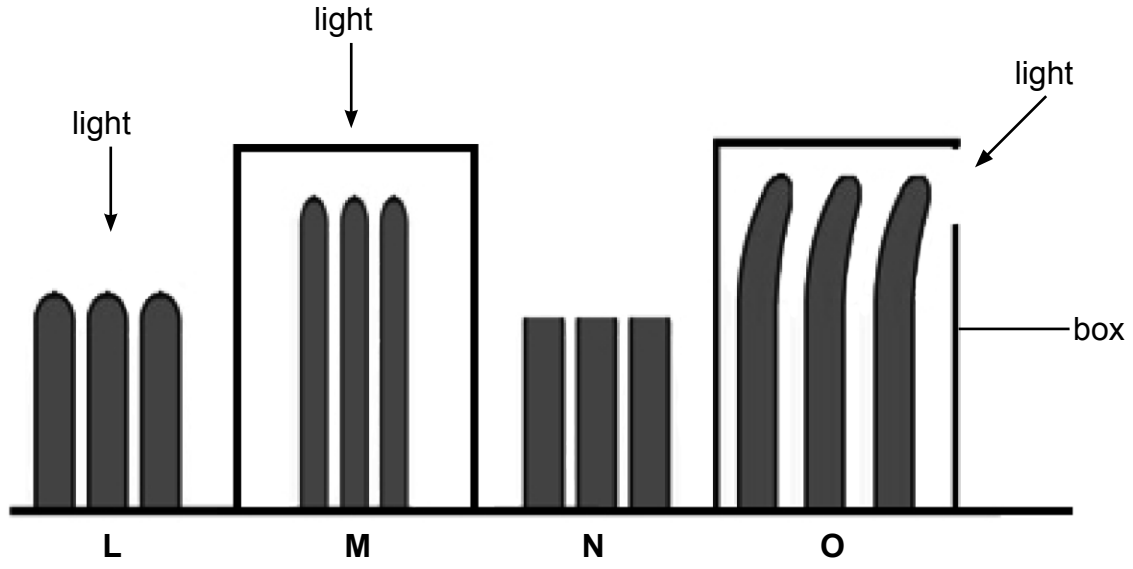

Fig. 4.1

(a) (i) Name the external condition that was different between group **L** and group **M**.

..... [1]

(ii) Explain how this difference influences the growth of the coleoptiles.

.....

.....

.....

..... [2]

(b) (i) Describe the difference between the coleoptiles in group **L** and group **N**.

.....

..... [1]

(ii) Explain the effect this difference has had on the growth of the coleoptiles in group **L** and group **N**.

.....

..... [1]

(c) Suggest **one** conclusion that can be made regarding the area where growth occurs in coleoptiles.

.....

..... [1]

For Examiner's Use

(d) Explain the results observed in group **O**.

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..... [6]

[12]

5 Fig. 5.1 shows a germinating broad bean seed.

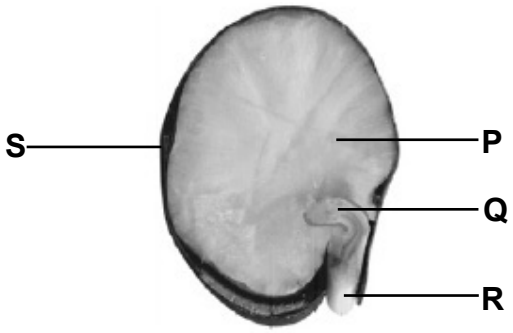

Fig. 5.1

(a) State the names of the parts labelled **P**, **Q**, **R** and **S**.

P.....

Q.....

R.....

S..... [4]

(b) List **three** conditions needed for this seed to germinate.

1.....

2.....

3..... [2]

(c) Design an experiment to find out the effect of pH on seed germination.

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.....

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..... [6]

[12]