

Centre Number	Candidate Number	Candidate Name
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NAMIBIA SENIOR SECONDARY CERTIFICATE

BIOLOGY HIGHER LEVEL

8321/1

PAPER 1

1 hour 30 minutes

Marks 70

2017

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 rough work, diagrams or graphs.
- You may use a non-programmable calculator.
- Do not use correction fluid.
- 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	
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6	
7	
Total	
<i>Marker</i>	
<i>Checker</i>	

This document consists of **15** printed pages and **1** blank page.



Republic of Namibia
MINISTRY OF EDUCATION, ARTS AND CULTURE

- 1 (a) Fig. 1.1 A shows the skeleton of the front leg of a lion, *Panthera leo*.
Fig. 1.1 B shows the skeleton of the wing of a seagull, *Larus dominicanus*.

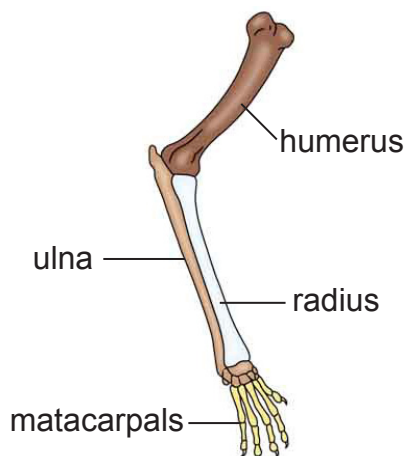


Fig. 1.1 A

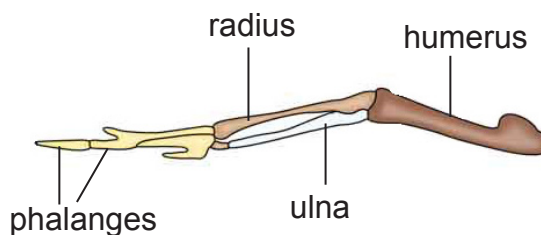


Fig. 1.1 B

- (i) Using examples from Fig. 1.1 A and Fig. 1.1 B, explain whether these structures are homologous or analogous.

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[2]

- (ii) Organisms are classified using the hierarchical classification system.
Classify the seagull as fully as possible by completing the table.

level of classification	group
.....	Animalia
Phylum
.....	Aves
Genus
.....

[3]

- (iii) Seagulls are classified as belonging to the group Aves.

State **two** diagnostic features of this group.

1.....

2.....

[2]

(b) The ulna is made up of bone tissue.
Explain what is meant by the term tissue.

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[2]
[9]

- 2 A Grade 12 student carried out an investigation to find out how wind speed affects the rate of transpiration. The investigation was carried out on a plant shoot which was exposed to still air and windy conditions. Transpiration rates were recorded for different widths of stomatal openings. Fig. 2.1 shows the results.

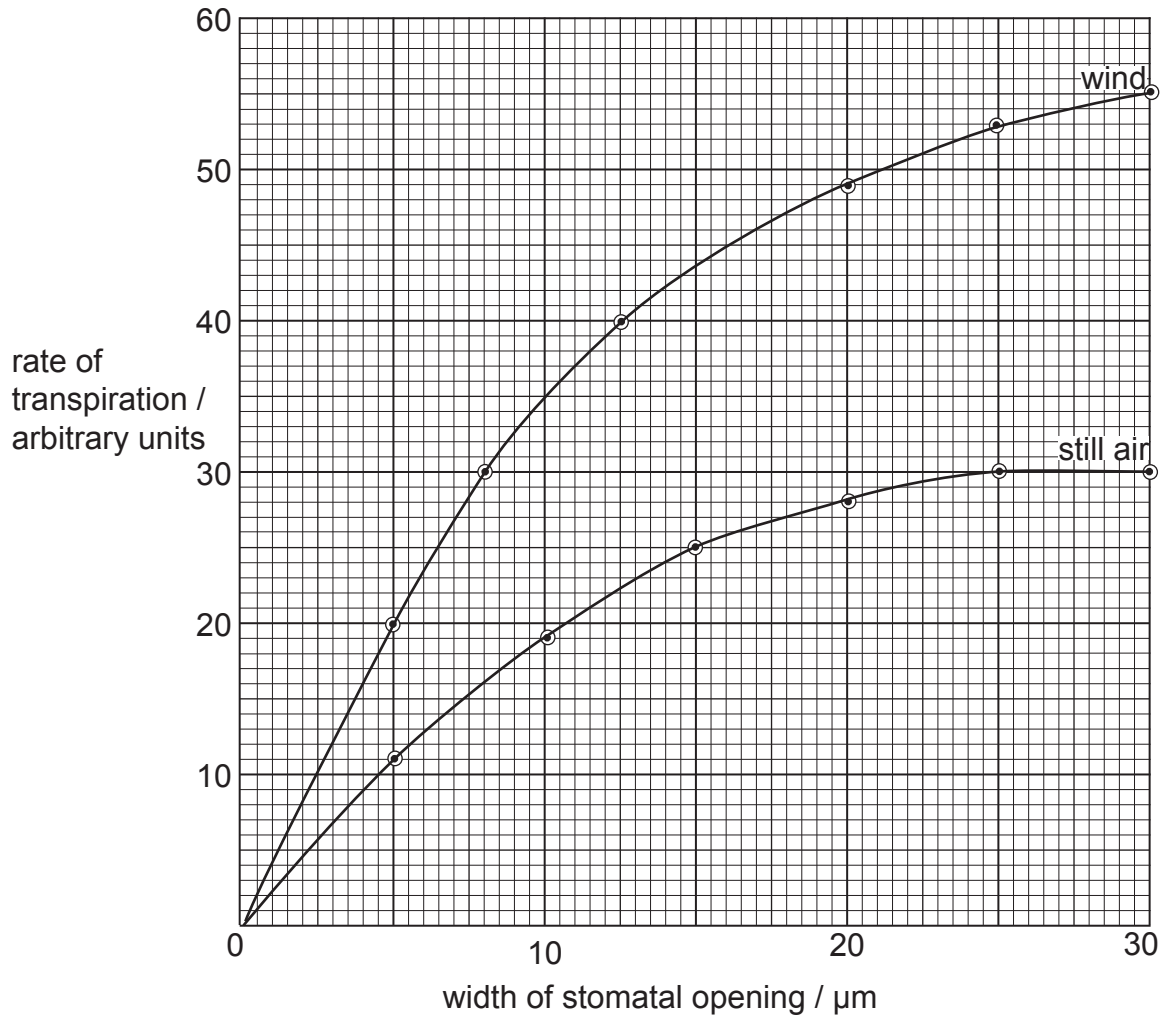


Fig. 2.1

- (a) State **one** factor, other than wind speed and width of stomatal opening, that can affect the rate of transpiration in plants.

..... [1]

- (b) From Fig. 2.1, determine the rate of transpiration when the stomatal openings were 25 μm wide in windy conditions.

..... [1]

(c) Compare the rate of transpiration in still air and in windy conditions when the width of the stomatal openings were 20 μm and explain why there is this difference.

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[3]

(d) In order to make her results more reliable, the student repeated the experiment.

Suggest how she could ensure that the experiment was a fair test.

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[3]

[8]

3 Fig. 3.1 shows aerobic respiration in muscle tissue.

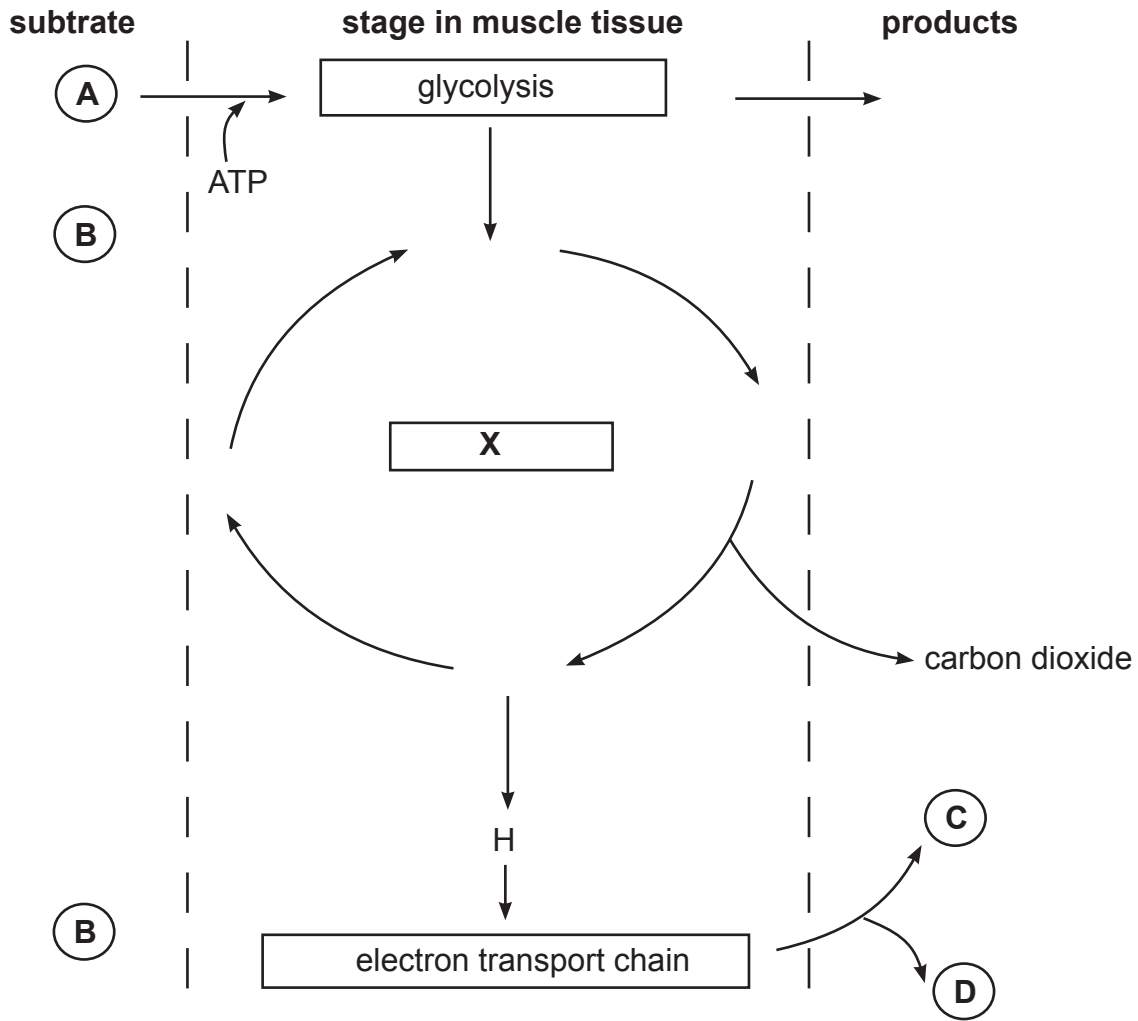


Fig. 3.1

(a) (i) Name the substrates **A** and **B** and products **C** and **D**.

Substrate **A**.....

Substrate **B**.....

Product **C**.....

Product **D**.....

[2]

(ii) Name the stage **X**.

.....

[1]

(iii) State the location of stage **X**.

.....

[1]

(b) Yeast respire anaerobically and is used in brewing and bread-making.

Describe, giving experimental details, how one can show that yeast respire anaerobically.

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[4]

[8]

4 Fig. 4.1 shows the human eye.

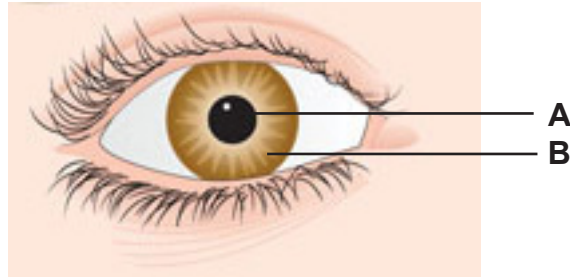


Fig. 4.1

(a) Name the structure labelled **A** on Fig. 4.1.

.....

[1]

(b) (i) State the function of the structure labelled **B**.

.....

[1]

(ii) Describe the changes that occur in structure **B** when a person moves from a dark room to a very light room.

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[2]

(c) With reference to **named structures** of the eye, describe what happens in the eye when a person who was looking at a distant object is now focussing on a near object.

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[5]

[9]

5 Endothermic animals maintain their body temperature by homeostasis.

(a) Define the term *homeostasis*.

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[2]

(b) Fig. 5.1 shows the effect of body temperature on the enzyme activity of a mammal and a reptile living at the Namibian coast.

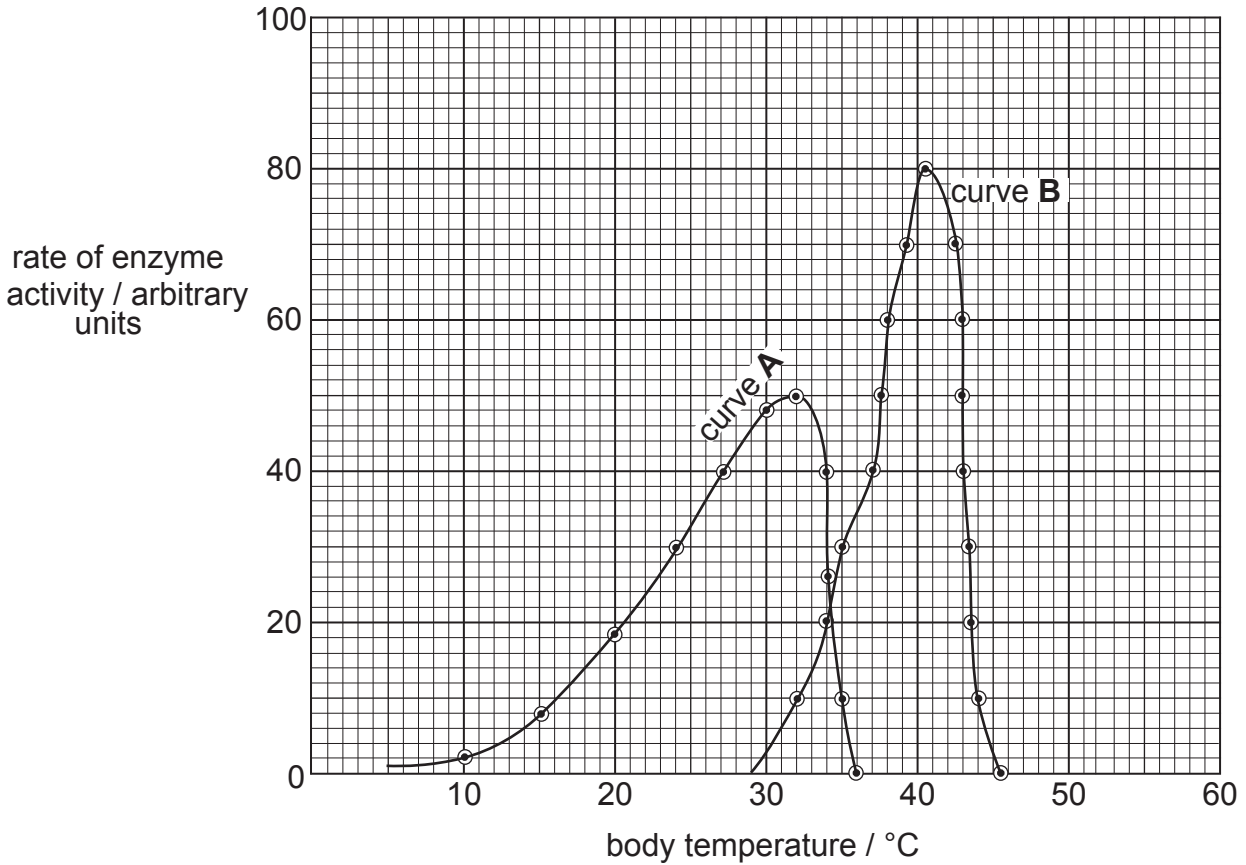


Fig. 5.1

(i) Describe the shape of curve A.

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[3]

(ii) Fig. 5.2 shows the effect of external temperature on body temperature of two different animals, **V** and **W**.

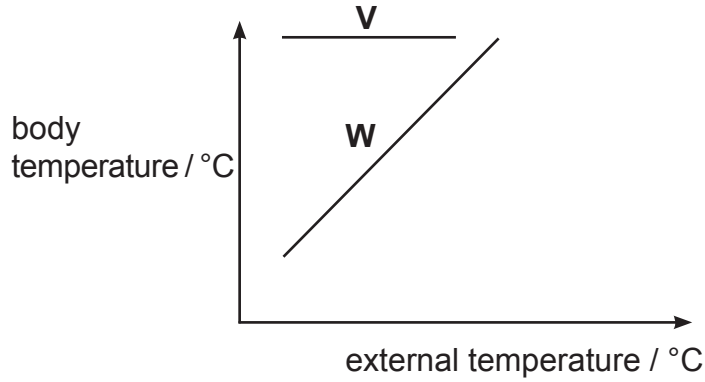


Fig. 5.2

Identify which of the lines represents an ectotherm and explain how these animals regulate their body temperature.

Animal.....

Explanation.....

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.....

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[4]

(c) The Damara dik-dik, which is a mammal, and the *Anchieta agama*, which is a reptile can both be found in the Etosha National Park in Namibia.



A mammal has a larger number of mitochondria per cell than a reptile.

Suggest how the larger number of mitochondria helps to maintain their body temperature.

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[3]

[12]

6 To produce functional enzymes, the nucleus has to control the activities of the cell very well.

(a) Define the term *enzyme*.

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

[2]

(b) Explain why DNA has to be replicated when a cell divides by mitosis.

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

[2]

(c) Sometimes a change in a DNA base occurs. This is a mutation.
Explain the effect that this might have on an enzyme.

.....
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[2]

(d) Similarly to genes, whole chromosomes can be affected by mutations.

- (i) Name a condition which results from having an extra copy of a chromosome in all body cells.

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[1]

- (ii) Fig. 6.1 shows meiosis in some mutated cells containing two chromosomes.

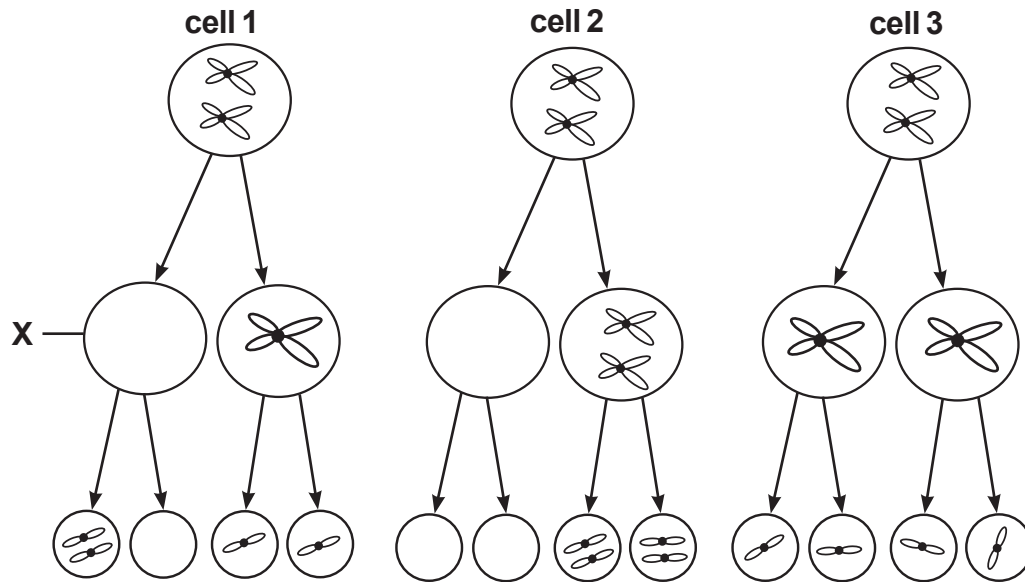


Fig. 6.1

Complete circle **X** on Fig. 6.1.

[1]

- (iii) If cell 1 underwent mitosis how many chromosomes would be present in each daughter cell?

.....

[1]

[9]

7 Peppered moths exist in two forms, light and dark. Fig. 7.1 shows the two forms of peppered moths.



Fig. 7.1

(a) (i) Which word describes differences within a population?

.....

[1]

(ii) A student sampled the moths in a woodland where the tree trunks were light in colour.

The table shows her results.

percentage of each type of moth	
light form	dark form
85	15

A few months later the trees were blackened with soot from a factory that had opened nearby.

Describe and explain how the populations of the two types of moth would change as a result of this.

.....

[4]

(b) The colour of peppered moths is controlled by a single gene with two alleles. The allele for the dark form is dominant.

(i) Define the terms *dominant* and *gene*.

Dominant

.....

.....

[2]

Gene

.....

.....

[2]

(ii) Use suitable letters to draw a genetic diagram to show the expected phenotypes and ratio of offsprings formed from a cross between a heterozygous dark form peppered moth and a light form peppered moth.

[6]

[15]

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