EXAMINATIONS COUNCIL OF SWAZILAND
Swaziland General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **6884/02**

Paper 2 Structured Questions **October/November 2018**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do **not** use staples, paper clips, glue or correction fluid.
Do **not** write on the barcode.

Answer **all** questions.

You may use an electronic calculator.
You may lose marks if you do not show your working or if you do not use appropriate units.

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	
6	
7	
Total	

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

1 Organisms are classified using certain features.

(a) State **two** main features used in the classification of bacteria.

1 .....

2 ..... [2]

(b) **Fig. 1.1** shows a fungus.

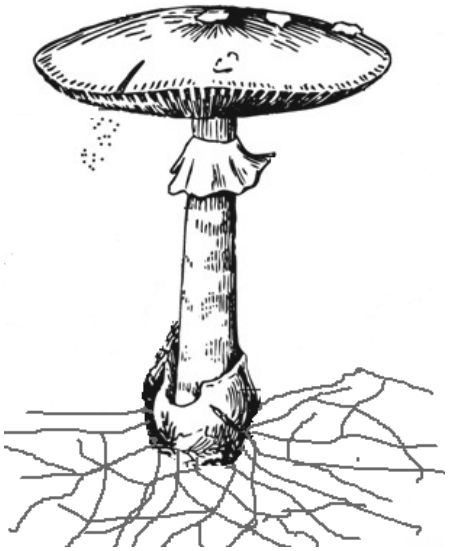

Fig. 1.1

Describe the main features of the fungus in Fig. 1.1 and explain its adaptations to its environment.

.....

.....

..... [2]

(c) Fungi are used to make single-cell proteins in large sterile fermentation tanks.

(i) State **two** conditions that must be kept constant in the fermentation tanks.

1 .....

2 ..... [2]

(ii) Explain why the fermentation tanks should be kept sterile.

.....

.....

..... [2]

(d) Outline how bacteria are used in genetic engineering to produce insulin on a large scale.

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..... [5]

[Total: 13]

[Turn over

2 **(a)** Fig. 2.1 shows the concentration of fats in different regions of the alimentary canal, **A**, **B** and **C**, and enzymes present in those regions.

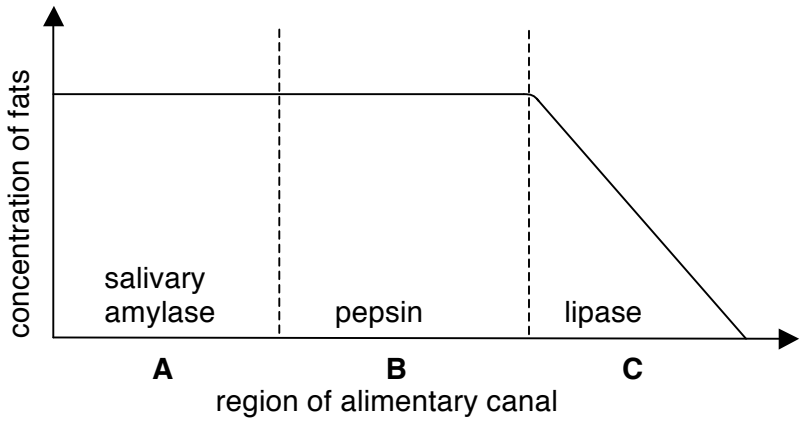

Fig. 2.1

(i) State the part of the alimentary canal represented by region **A**.

..... [1]

(ii) Describe and explain changes in the concentration of fats that occur as they move through region **C**.

description .....

.....

explanation .....

.....

..... [3]

(b) The walls of the ileum have structures called villi.

Describe **two** features of the villi and explain how each feature helps to adapt the villi to their function.

feature 1 .....

explanation .....

feature 2 .....

explanation .....

..... [4]

(c) Describe the role of the liver in the deamination of amino acids.

.....

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..... [3]

[Total: 11]

3 **(a)** Fig. 3.1 shows an investigation carried out to find the effect of varying light intensity on the rate of gas released by a water plant.

The light bulb is placed at 4 m, 3 m, 2 m and 1 m from the water plant as shown in Fig. 3.1. The number of bubbles released in the same period of time is noted for each distance.

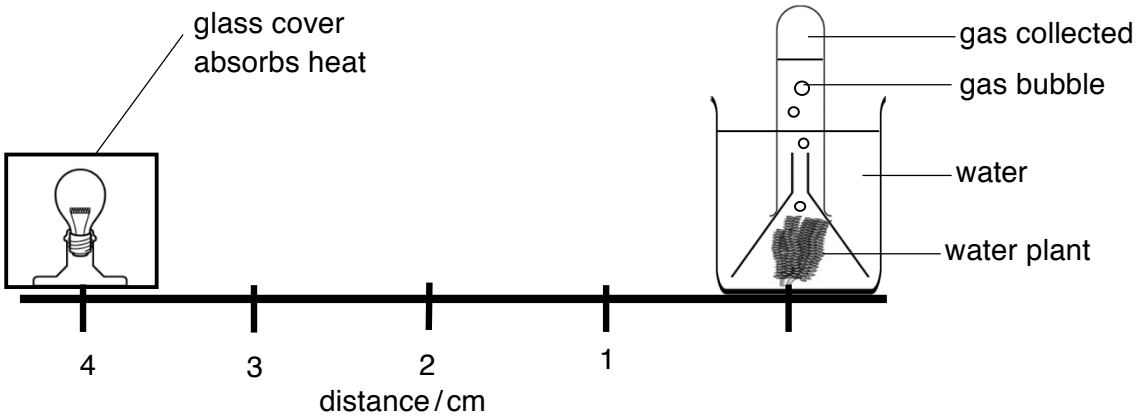

Fig. 3.1

(i) Name the gas collected in the test-tube.

..... [1]

(ii) Explain why the number of bubbles increases when the light bulb is moved from 4 m to 3 m from the water plant.

.....

.....

..... [2]

(iii) Suggest why the number of bubbles released remains constant when the light bulb is moved from 2 m to 1 m from the water plant.

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..... [2]

(b) Nitrogen-containing fertilisers are applied to a crop growing in a field. During heavy rains the fertilisers are washed from the field into a nearby pond.

Describe the effect of nitrogen-containing fertilisers on plants and other organisms in the pond water.

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..... [5]

[Total: 10]

4 **(a)** When compared with a vena cava, describe:

(i) the internal diameter of the aorta

.....

..... [1]

(ii) the thickness of the muscle layer of the aorta.

.....

..... [1]

(b) Describe **two** differences in composition between blood in the left ventricle and blood in the right ventricle.

1 .....

.....

2 .....

..... [2]

(c) Explain how a blockage in a coronary artery might lead to a heart attack.

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..... [3]

(d) Blood is a tissue with components which perform different functions.

(i) Describe how blood clotting occurs when there is a cut in the skin.

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..... [3]

(ii) State **two** other functions of blood plasma.

1 .....

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2 .....

..... [2]

[Total: 12]

5 **(a)** Fig. 5.1 shows a cross section of a root.

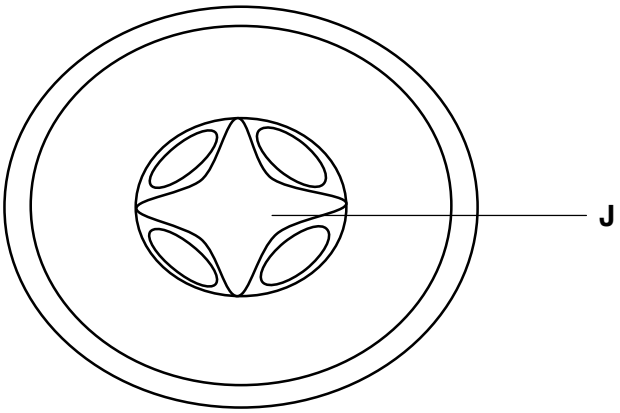

Fig. 5.1

(i) State **two** adaptations of the part labelled **J** in Fig. 5.1 for its transport function.

1 .....

2 ..... [2]

(ii) Describe and explain the uptake of magnesium ions from the soil into the xylem vessels against their concentration gradient.

.....

.....

..... [2]

(b) Transpiration pull plays a major role in the movement of water up the plant.

Describe and explain how transpiration pull assists in the movement of water up a plant.

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..... [4]

(c) Describe how glucose made in leaves gets to other parts of the plant where it is used.

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..... [3]

(d) Aloe plants grow in dry environments and garden rockeries.

Fig. 5.2 **A** is a picture of an aloe plant leaves while Fig. 5.2 **B** is a picture of some cross-sections of one of its leaves.

A

B

Fig. 5.2

Describe and explain, with reference to Fig. 5.2 **A** and **B**, **two** adaptations of the aloe plant to its environment.

adaptation 1 .....

explanation .....

.....

adaptation 2 .....

explanation .....

..... [4]

[Total: 15]

6 **(a)** Fig. 6.1 shows a plant reproducing asexually.

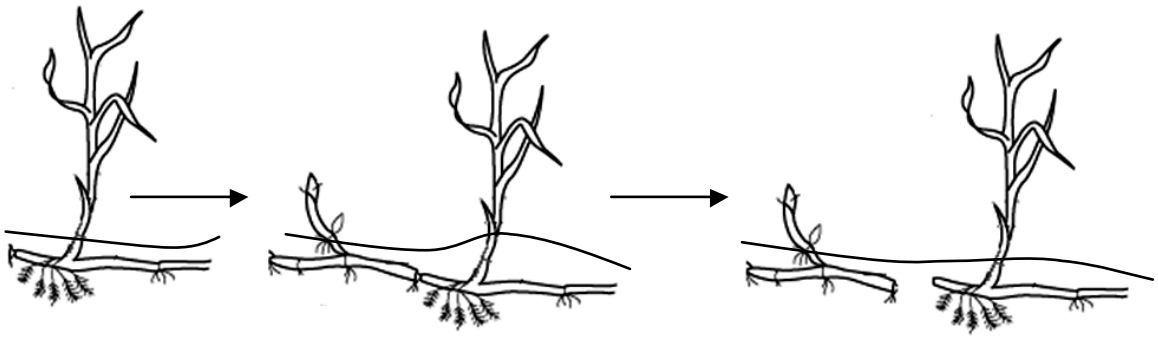

Fig. 6.1

(i) Describe the type of reproduction shown in Fig. 6.1.

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..... [3]

(ii) State **two** advantages of the type of reproduction shown in Fig. 6.1.

1 .....

2 ..... [2]

(b) Fig. 6.2 shows changes in the uterus lining during a 28-day menstrual cycle.

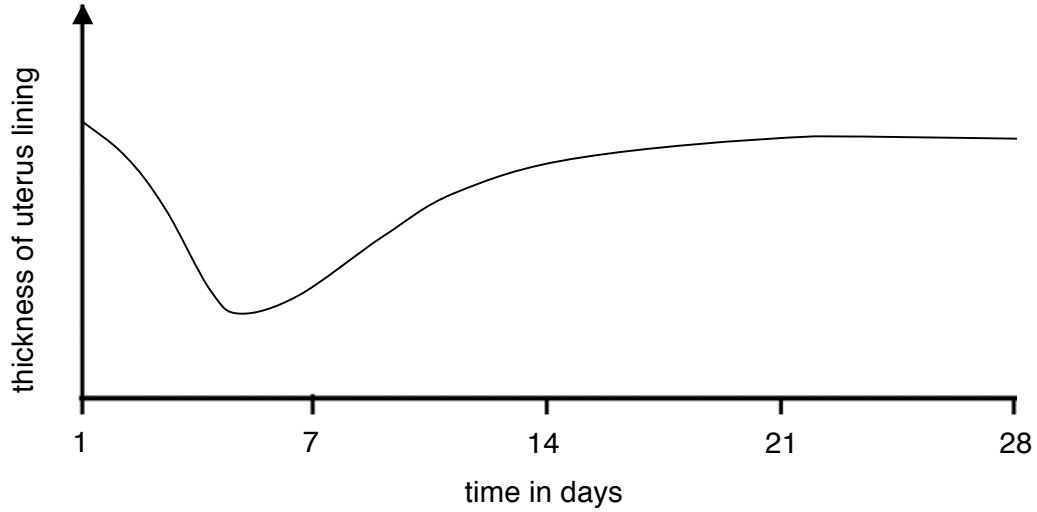

Fig. 6. 2

Describe and explain what will happen to the uterus lining in Fig. 6.2 immediately after day 28 if fertilisation has not occurred.

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..... [3]

(c) One of the functions of the placenta is to allow exchange of substances between mother and foetus.

Describe **two** other functions of the placenta.

1 .....

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2 .....

..... [2]

(d) A woman who is unable to conceive may be treated using fertility drugs.

Describe how fertility drugs are used to treat infertility.

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..... [3]

[Total: 13]

7 Sickle cell anaemia is a condition in which faulty haemoglobin is formed in red blood cells.

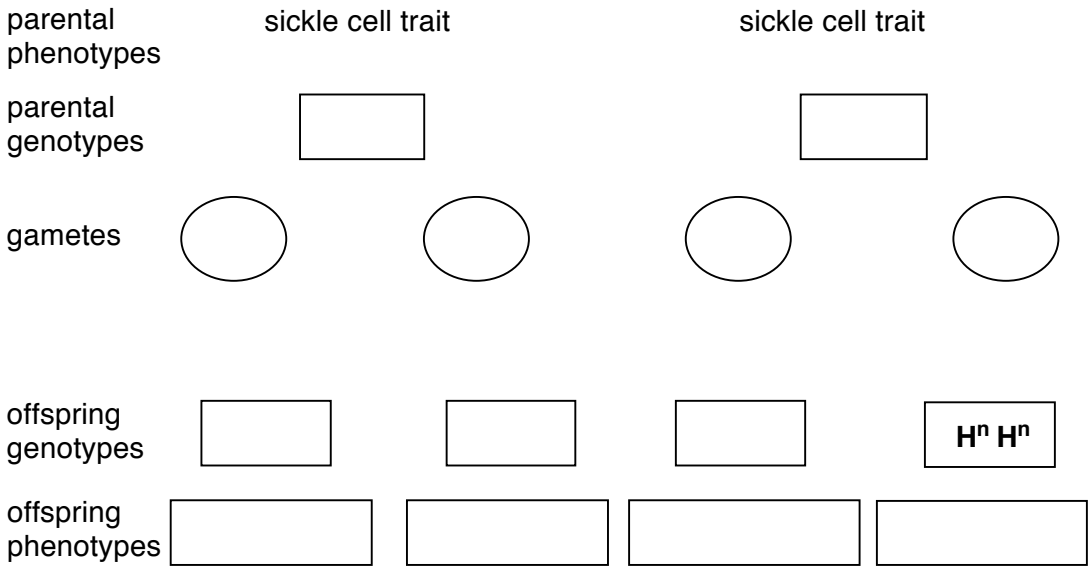
The formation of haemoglobin under normal oxygen concentration in the blood is controlled by the alleles:

$\mathbf{H^N}$ – produces normal haemoglobin,

$\mathbf{H^n}$ – produces faulty haemoglobin.

(a) A person who produces both normal haemoglobin and faulty haemoglobin is described as having sickle cell trait.

Complete the genetic diagram in Fig. 7.1 to show the inheritance of sickle cell anaemia where the two parents have sickle cell trait.



[4]

Fig. 7.1

(b) Describe and explain how a person who is heterozygous for sickle cell anaemia is unlikely to suffer from malaria.

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..... [2]

[Total: 6]

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