EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **6884/02**

Paper 2 Structured Questions **October/November 2019**

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 the spaces provided.
Write your answers 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 any barcodes.

Answer **all** questions.
You may use an electronic calculator.

You may lose marks if you do not show your working or 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	
8	
Total	

This document consists of **14** printed pages and **2** blank pages.

1 **(a)** Fig. 1.1 shows a longitudinal section of a human tooth.

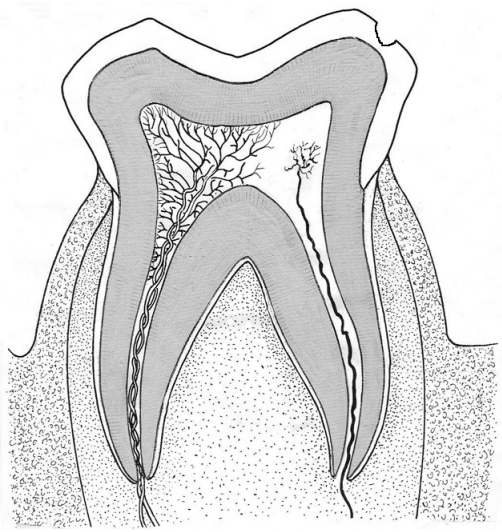

Fig. 1.1

(i) Name the type of tooth shown in Fig. 1.1, stating a reason for your choice.

type of tooth .....

reason .....

..... [2]

(ii) On Fig. 1.1, label and name the area where blood vessels are located. [1]

(iii) The tooth in Fig. 1.1 has a cavity on one side.

Explain why the cavity does not cause toothache.

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..... [3]

(iv) Suggest how the use of fluoride could prevent the condition of the tooth in Fig. 1.1.

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..... [2]

(b) Describe and explain the effect of chewing a piece of bread on the digestion of starch.

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..... [3]

(c) Describe the process involved in the movement of food from the mouth into the stomach.

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..... [2]

(d) Describe and explain the effect of liver cirrhosis on the digestion of fats in the duodenum.

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..... [4]

[Total: 17]

[Turn over

2 **(a)** In an investigation, a potato is cut into five identical cylinders. The cylinders are placed in different concentrations of salt solution.

Table 2.1 shows the length of potato cylinders before and after they have been placed in the salt solutions.

Table 2.1

potato cylinder	concentration of solution (mol/dm^3)	initial length (mm)	final length (mm)	change in length (mm)
C	1.00	60.00	56.50	–3.50
D	0.65	60.00	58.00	–2.00
E	0.50	60.00	60.00	0.00
F	0.25	60.00	61.50	1.50
G	0.13	60.00	64.00	4.00

(i) State the concentration in which the length of the potato cylinder **decreased** the most.

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..... [1]

(ii) Explain the observed change in length of potato strip **F** in terms of water potential and turgor pressure.

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..... [4]

(b) Describe and explain the uptake of magnesium ions from the soil by a potato plant.

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..... [3]

[Total: 8]

3 **(a)** Fig. 3.1 shows a cross-section of a plant stem.

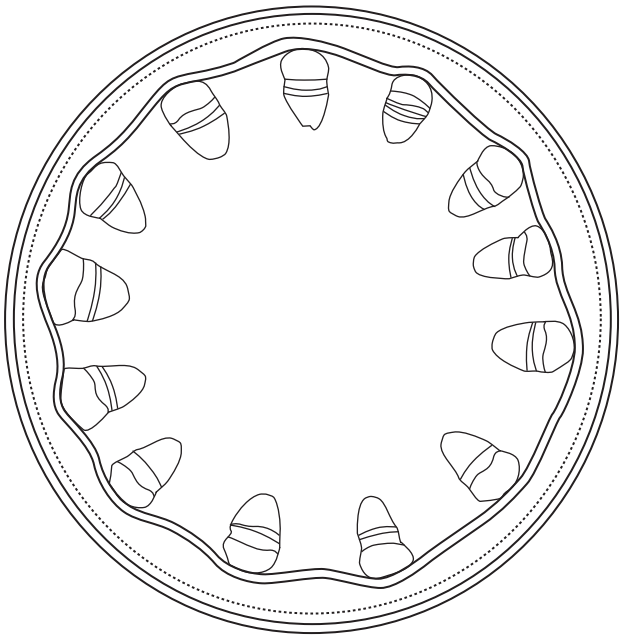

Fig. 3.1

(i) On Fig. 3.1, shade **one** area through which water is transported as it moves up the stem. [1]

(ii) State a feature **shown** in Fig. 3.1 that identifies it as a cross-section of a dicot stem.

.....

..... [1]

(b) Describe what happens in the cells of a seedling when it wilts.

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..... [3]

[Turn over

(c) Carbohydrates are produced in the leaves and transported to other parts of the plant.

Describe how carbohydrates are transported to the other parts of the plant.

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..... [3]

[Total: 8]

4 (a) A student recorded their heart rate and breathing rate when walking or running over a period of three days. Their results are shown in Fig. 4.1.

The student also recorded their average resting heart rate, which was 72 beats per minute.

Fig. 4.1 shows results of the investigation.

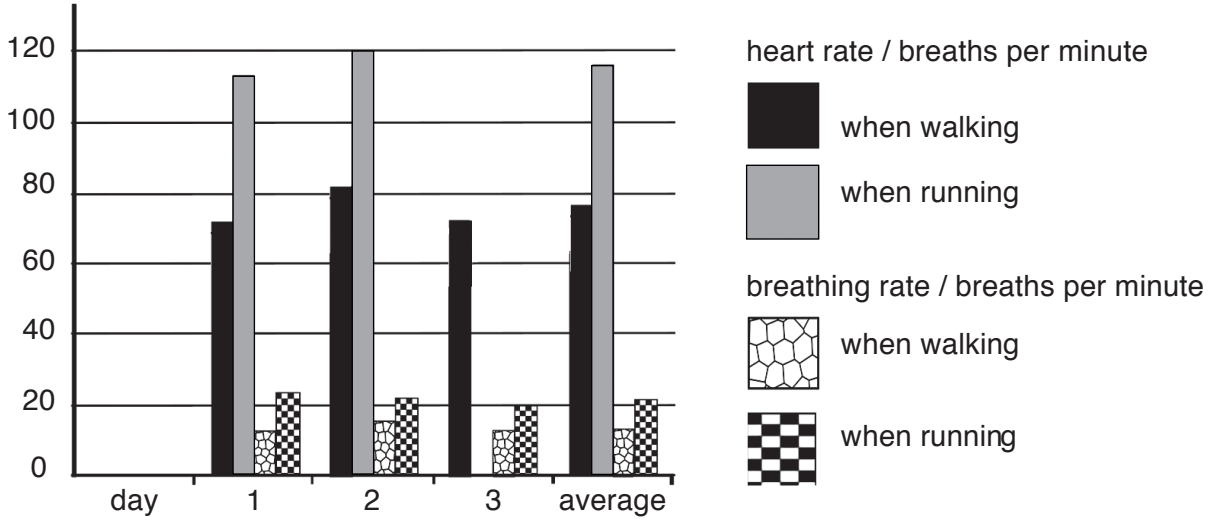

Fig. 4.1

(i) Estimate the student's heart rate on day 3 when running.

..... [1]

(ii) Describe and explain the changes observed in the heart rate when walking and when running over the three days.

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..... [5]

(b) An athlete trains at an altitude much higher than where he lives. The number of red blood cells in his body increases at a higher altitude.

There is a lower concentration of oxygen at higher altitude.

Explain the advantage of having an increase in the number of red blood cells at higher altitude.

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..... [3]

(c) Lack of exercise may result in coronary heart disease.

(i) Describe coronary heart disease.

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..... [1]

(ii) State one **other** factor that may cause coronary heart disease.

..... [1]

[Total: 11]

5 During a medical check-up, a 43 year old pregnant woman is told that her chromosomes have undergone a mutation resulting in her foetus inheriting an extra chromosome. She also discovers that the placenta is 25% less than its normal size.

(a) Define the term *mutation*.

..... [1]

(b) Describe the roles of follicle stimulating hormone (FSH) and luteinising hormone (LH) in the menstrual cycle.

FSH .....

.....

LH .....

..... [2]

(c) Suggest what effects the change in the size of this woman's placenta may have on the foetus.

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..... [5]

[Turn over

(d) During delivery the woman is injected with a hormone that speeds up the delivery process.

Describe the events that occur during the delivery process.

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..... [3]

(e) The woman chooses a hormonal implant to stop any further pregnancies.

Describe how the hormonal implant will stop any further pregnancies.

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..... [2]

[Total: 13]

6 **(a)** A person moves towards a light source starting from a distance of 300 cm away as shown in Fig. 6.1.

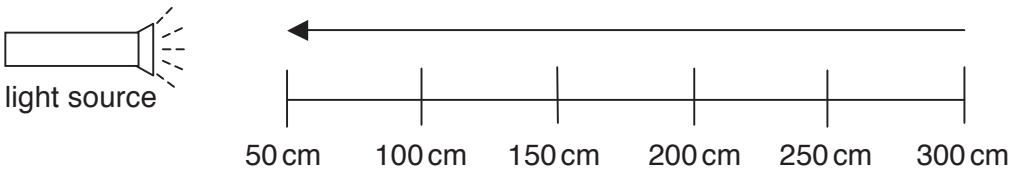

Fig. 6.1

(i) Name the light sensitive cells of this person that are stimulated by the light source.

..... [1]

(ii) Describe and explain the changes observed in the pupil in the eye, as the person moves towards the light source.

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..... [3]

(iii) State **two** ways the pupil reflex differs from a hormonal action.

1 .....

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2 .....

..... [2]

[Turn over

(b) Heroin is a recreational drug.

(i) Define the term *drug*.

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..... [2]

(ii) Describe the dangers of heroin misuse on personal health.

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..... [3]

[Total: 12]

7 Insulin and glucagon regulate the concentration of glucose in the blood.

(a) Name the organ in the body that secretes insulin and glucagon.

..... [1]

(b) Fig. 7.1 shows the changes in the concentration of glucagon of a healthy person over a six hour period.

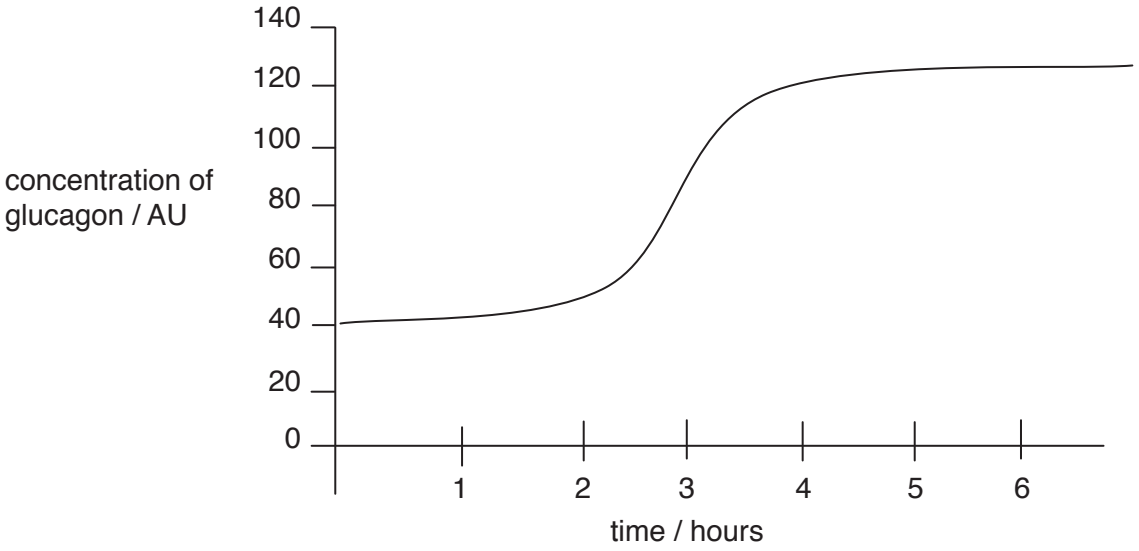

Fig. 7.1

(i) State the concentration of glucagon at three hours.

..... [1]

(ii) Describe and explain what happens to the concentration of glucose in the blood as the concentration of glucagon changes as shown in Fig. 7.1.

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..... [4]

[Total: 6]

[Turn over

8 Some characteristics of organisms such as colour blindness are said to be sex-linked.

(a) A woman who is a carrier for colour blindness marries a man who has normal colour vision.

Using a genetic diagram, predict the probability that this couple has a son who is colour blind.

[5]

(b) Explain why males are more likely to suffer from colour blindness than females.

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..... [1]

[Total: 6]

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