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 2022**

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 in the spaces provided.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough work.
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	
8	
Total	

This document consists of **13** printed pages and **3** blank pages.

1 Fig. 1.1 shows the proportions of nutrients in three food samples.

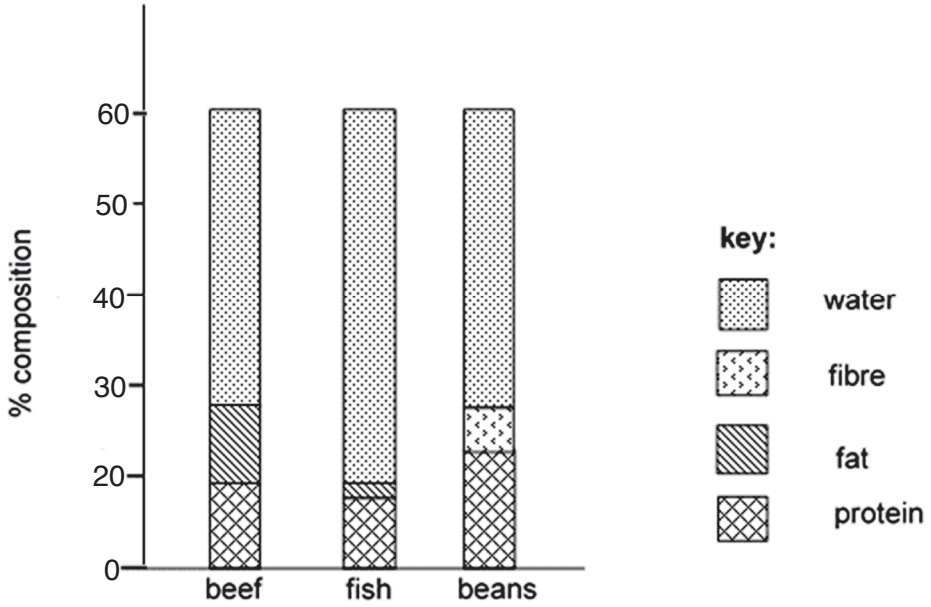

Fig. 1.1

(a) State, with reasons, the food sample that should be:

(i) eaten to reduce the risk of colon cancer.

food .....

reason .....

..... [2]

(ii) only eaten in small amounts to reduce the risk of developing coronary heart disease.

food .....

reason .....

..... [2]

(b) State **one** aspect of a healthy lifestyle that may reduce the risk of suffering from coronary heart disease.

.....

..... [1]

(c) The food moves through the alimentary canal by peristalsis.

Describe the process of peristalsis.

.....

.....

.....

..... [2]

(d) State the disadvantage of excess fluoride in natural water sources.

.....

..... [1]

[Total: 8]

2 Water absorbed by roots from the soil moves up the stem and is lost through transpiration.

(a) Describe the processes by which water is:

(i) absorbed from the soil

.....

.....

.....

..... [2]

(ii) transported up the stem.

.....

.....

.....

.....

..... [3]

(b) Describe the process of transpiration.

.....

.....

.....

..... [2]

(c) Trees can be cut for commercial purposes.

Explain the implications on global warming of cutting down trees.

.....

.....

.....

.....

..... [3]

[Total: 10]

3 **(a)** Fig. 3.1 is a diagram of the human circulatory system.

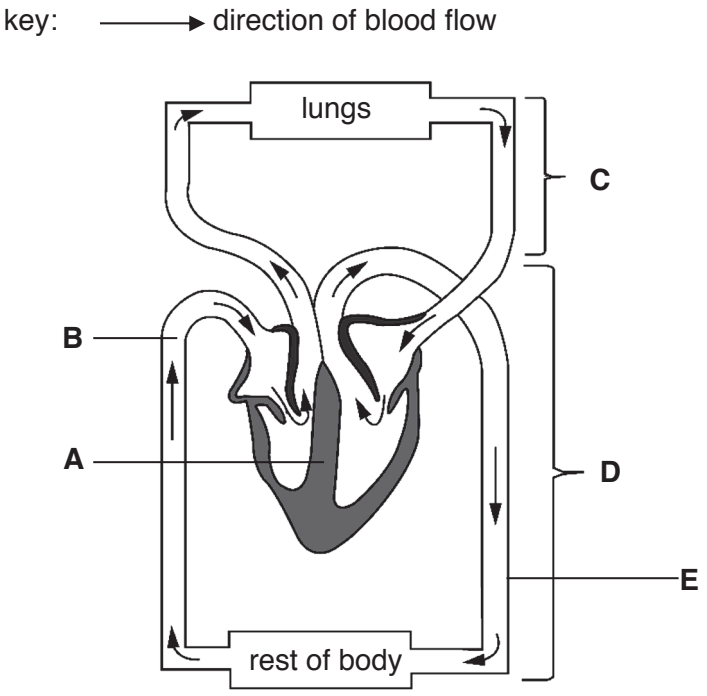

Fig. 3.1

(i) Name the part labelled **A** in Fig. 3.1.

..... [1]

(ii) Describe the structure of blood vessel **B**.

.....

.....

..... [3]

(iii) Describe **two** differences between circuits **C** and **D**.

1 .....

.....

2 .....

..... [2]

(iv) Describe and explain how digested food from blood vessel **E** reaches the body cells.

.....

.....

.....

.....

.....

..... [4]

(b) An investigation was conducted by a group of students to find out the effect of exercise on the pulse rate.

The pulse rate was measured at rest, immediately after exercise and three minutes after exercise.

The exercise ended at 3 minutes.

The results of the investigation are shown in Fig. 3.2.

Fig. 3.2

(i) Describe and explain the effect of exercise on the pulse rate from the graph in Fig. 3.2 between 1 and 3 minutes.

.....

.....

.....

.....

.....

..... [3]

(ii) Explain why the pulse rate remained high even after the exercise.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 16]

4 **(a)** Vaccination provides immunity against diseases.

(i) Explain how vaccination provides active immunity.

.....

.....

.....

.....

..... [4]

(ii) Explain how passive immunity differs from active immunity.

.....

.....

.....

..... [2]

(b) The immune system is also responsible for phagocytosis and tissue rejection.

(i) Describe phagocytosis.

.....

.....

..... [2]

[Turn over

(ii) Explain how tissue rejection is prevented.

.....

.....

..... [2]

[Total: 10]

5 Farmers spray their fields with a chemical to kill weeds.

(a) Name the chemical in the sprays that kills the weeds.

..... [1]

(b) Describe the mechanism by which the chemical in the sprays kills the weeds.

.....

.....

.....

.....

..... [4]

(c) State **one** undesirable effect, on the balance in the ecosystem, of using the weed killer.

..... [1]

(d) The soil in which crops grow requires a good supply of oxygen.

(i) Explain why a poor supply of oxygen may affect the absorption of magnesium.

.....

.....

.....

..... [3]

(ii) State the function of magnesium in the crops.

.....

..... [1]

[Total: 10]

6 **(a)** An investigation is carried out to find the effect of light intensity on the size of the pupil.

Table 6.1 shows the results.

Table 6.1

distance of eye from light source/m	pupil diameter/mm
2	2.4
4	4.3
6	6.0
8	7.5
10	9.0

(i) Calculate the percentage change in diameter of the pupil between 2 m and 4 m.

Give your answer to one decimal place.

..... [2]

(ii) Describe the reflex arc followed by a nerve impulse as the eye moves further away from the light source.

.....

.....

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.....

.....

..... [3]

[Turn over

(b) Fig. 6.1 shows a homeostatic mechanism used to regulate the concentration of glucose in the human body by the endocrine system.

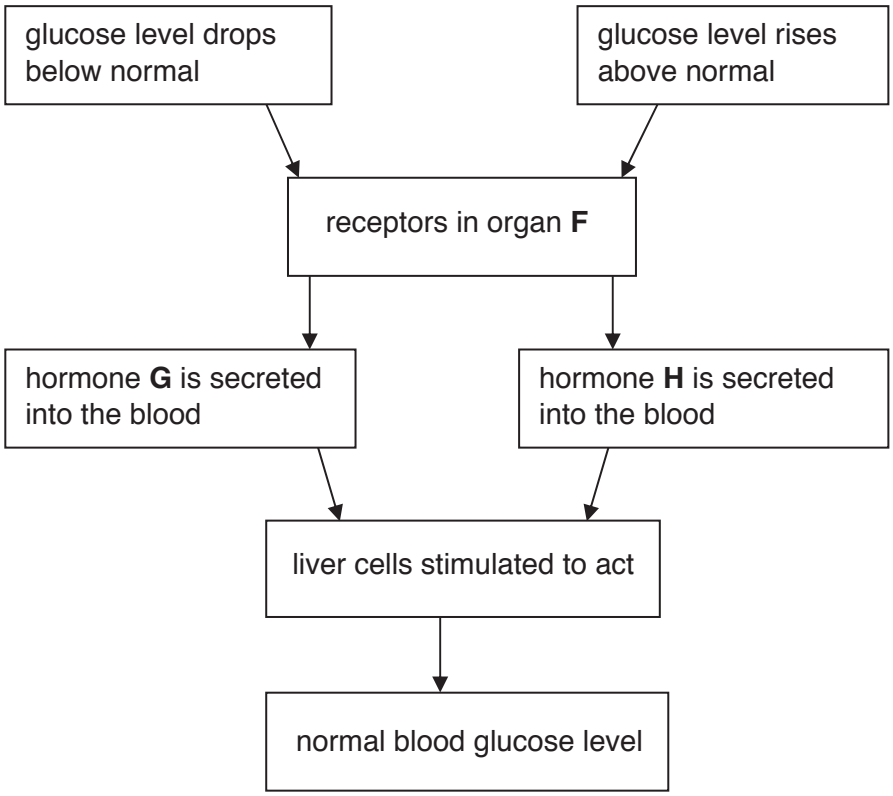

Fig. 6.1

(i) Define the term *homeostasis*.

.....

..... [1]

(ii) Describe, with reference to named organ **F** and hormone **H**, how the body maintains a constant blood glucose level after a meal rich in carbohydrates.

.....

.....

.....

.....

.....

..... [3]

(c) Coordination in the body is brought about by the nervous and endocrine systems.

Complete Table 6.2 by comparing the endocrine and the nervous system.

Table 6.2

	endocrine system	nervous system
1		
2		

[2]

[Total: 11]

7 Fig. 7.1 shows the use of biotechnology in cloning.

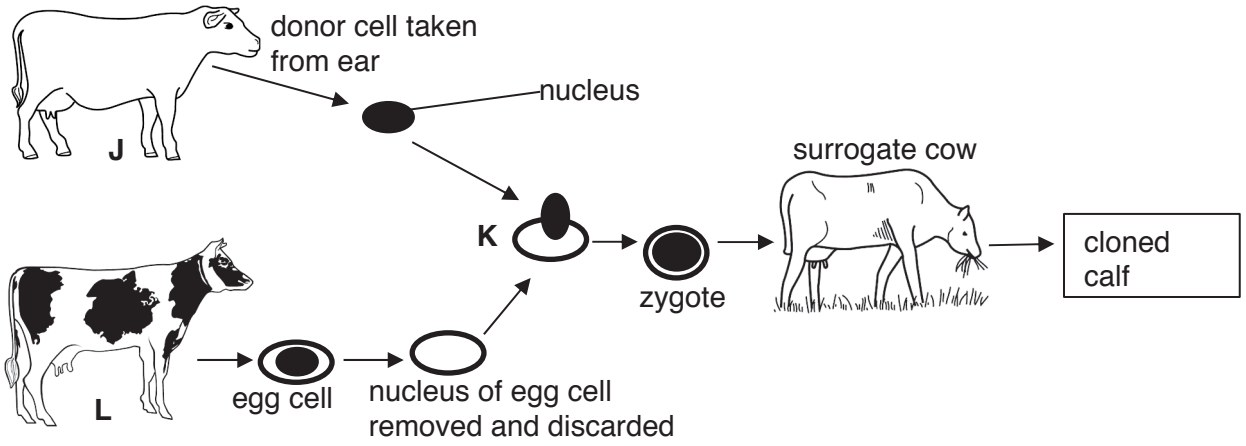

Fig. 7.1

(a) (i) State the name used to describe the set of chromosomes in the donor nucleus.

..... [1]

(ii) State the type of cell division that will occur after stage **K**.

..... [1]

(iii) Explain which cow, **J** or **L**, will the cloned calf be identical to.

.....

.....

.....

..... [2]

(iv) Describe how the method of reproduction in Fig. 7.1 differs from sexual reproduction.

.....

..... [1]

(b) Bacteria are often used in genetic engineering to make useful products.

(i) Explain why bacteria are used in genetic engineering.

.....

.....

.....

..... [2]

(ii) State **one** advantage and **one** disadvantage of producing genetically modified organisms.

advantage .....

.....

disadvantage .....

.....

..... [2]

[Total: 9]

8 **(a)** Genetically identical twins **M** and **N** are 15 years old and have a mass of 45.6 kg and 75 kg respectively.

(i) State the type of variation shown by the mass of the twins.

..... [1]

(ii) State **one** environmental factor that could have led to the differences in mass of the identical twins.

..... [1]

(b) People with viral infections are sometimes given anti-retroviral (ARV) treatment. However, some viruses have developed resistance to ARVs.

Suggest how resistance to ARVs develops.

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..... [4]

[Total: 6]

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