



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 2020

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 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 **14** printed pages and **2** blank pages.

- 1 The scientific name for the modern human being is *Homo sapiens*, a mammal belonging to phylum chordata, the family of hominids and the order of primates.

Place the five classification groups of the modern human being in the boxes in their correct order, starting with the largest to the smallest.

The first two have been done for you.

animalia

chordata

[5]

[Total: 5]

2 During yoghurt production milk is kept at an optimum temperature. Bacteria are added which make the milk turn sour.

(a) (i) State why the milk is kept at an optimum temperature.

.....
..... [1]

(ii) Describe the process that results in the sour taste of yoghurt.

.....
.....
..... [2]

(b) Antibiotics are used to cure bacterial infections. Some bacteria develop resistance to these antibiotics.

Describe how antibiotic-resistant bacteria develop.

.....
.....
.....
.....
.....
..... [4]

[Total: 7]

3 During exercise, the muscles use energy from both aerobic and anaerobic respiration.

(a) State **two** differences between aerobic and anaerobic respiration in humans.

1

2 [2]

(b) Fig. 3.1 shows the heart rates of two students, **A** and **B**, during and after a 3-minute exercise.

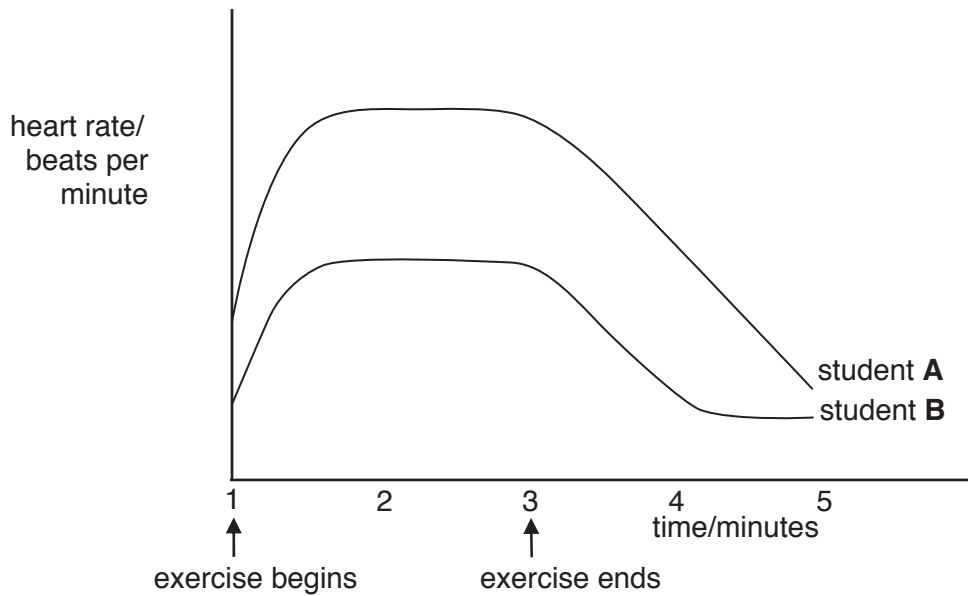


Fig. 3.1

(i) Use Fig. 3.1 to describe and explain why student **B** is fitter than student **A**.

.....

.....

.....

..... [3]

(ii) Explain the advantages of the increase in heart rate of both students during the exercise.

.....

.....

.....

..... [3]

(c) Lack of exercise can lead to coronary heart disease.

Describe how coronary heart disease develops and **one** way it could be prevented apart from exercising.

how it develops:

.....

.....

.....

.....

..... [3]

prevention:

.....

..... [1]

[Total: 12]

4 Fig. 4.1 is a flow chart showing the pathway of a nerve impulse when the pupil is exposed to bright light.

(a) Complete the flow chart to show the pathway of the nerve impulse.

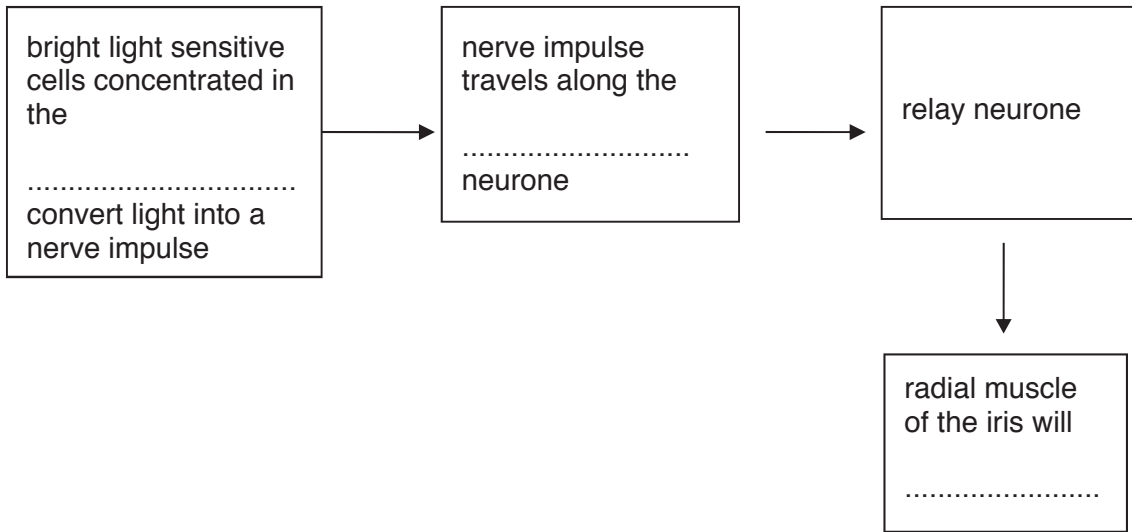


Fig. 4.1

[3]

(b) Describe the advantage of the response shown by the eye when it is exposed to bright light.

.....

.....

..... [2]

(c) Coordination in the body is brought about by hormonal and nervous control.

Describe how coordination by hormones differs from coordination in the eye when exposed to bright light.

.....

.....

.....

..... [3]

[Total: 8]

5 (a) Fig. 5.1 represents diploid and haploid cells in the human body.

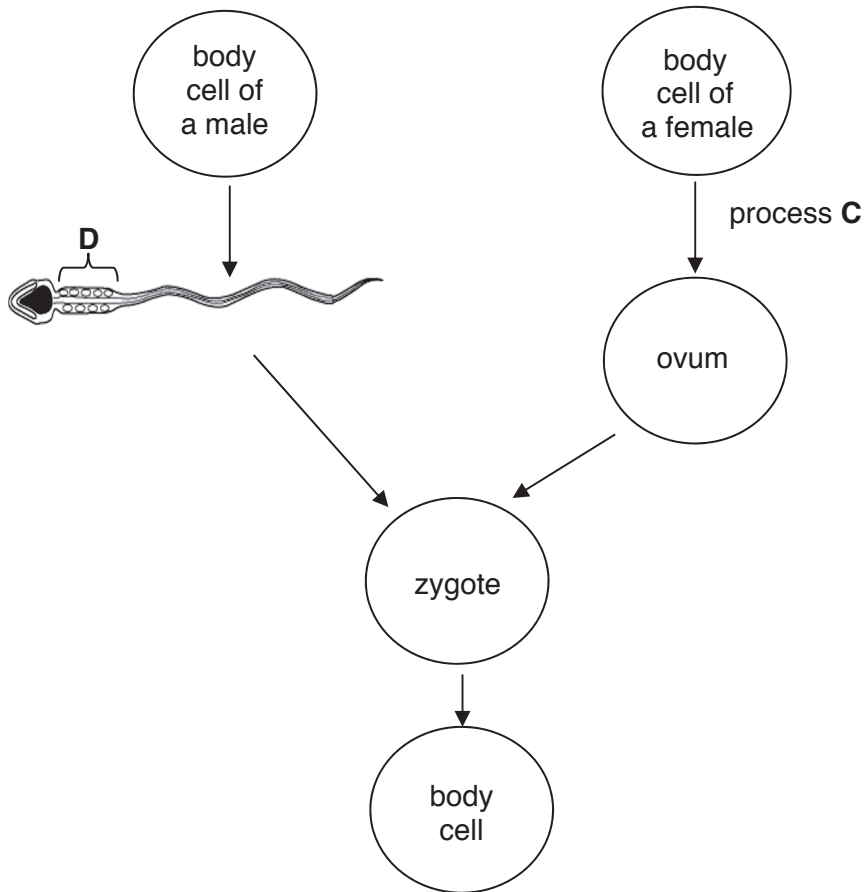


Fig. 5.1

(i) Name process C in Fig. 5.1.

..... [1]

(ii) State the number of chromosomes in the zygote.

..... [1]

(iii) Describe how the structure labelled D is related to the cell's function.

.....

 [2]

(b) Colour blindness is a sex-linked characteristic. The allele for red-green colour blindness, X^b , is recessive to the allele for normal colour vision, X^B .

(i) State what is meant by *sex-linked characteristics*.

.....
.....
..... [2]

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

Draw a genetic diagram to determine the probability that their first daughter is colour blind.

..... [5]

(iii) Explain why the man cannot pass the colour blindness trait to his son.

.....
.....
..... [2]

[Total: 13]

6 Fig. 6.1 shows a transparent greenhouse where crops are grown to minimise the effects of limiting factors for the process of photosynthesis.

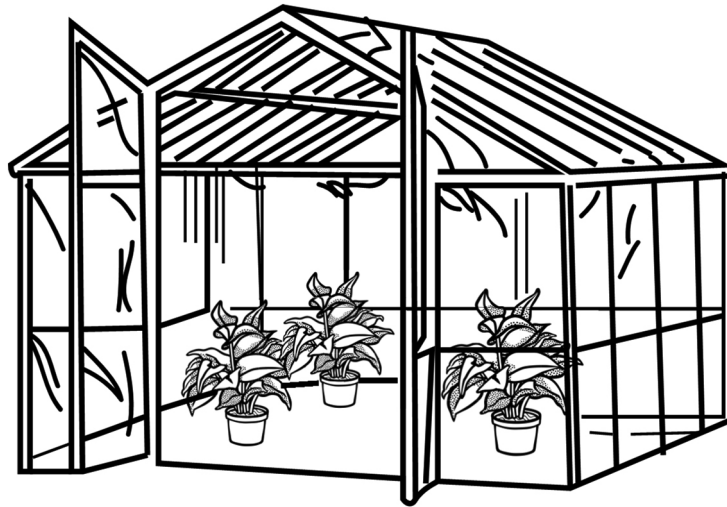


Fig. 6.1

(a) State a reason for the greenhouse being transparent.

.....
..... [1]

(b) Sometimes coal is burnt in the greenhouse.

Explain how burning coal improves food production inside the greenhouse.

.....
.....
.....
..... [3]

(c) Magnesium-containing fertilisers are added to crops in the greenhouse.

Describe and explain why a lack of magnesium ions in the greenhouse may limit growth of the crops.

.....
.....
.....
..... [4]

[Total: 8]

7 (a) Fig. 7.1 shows a photomicrograph of a blood smear.

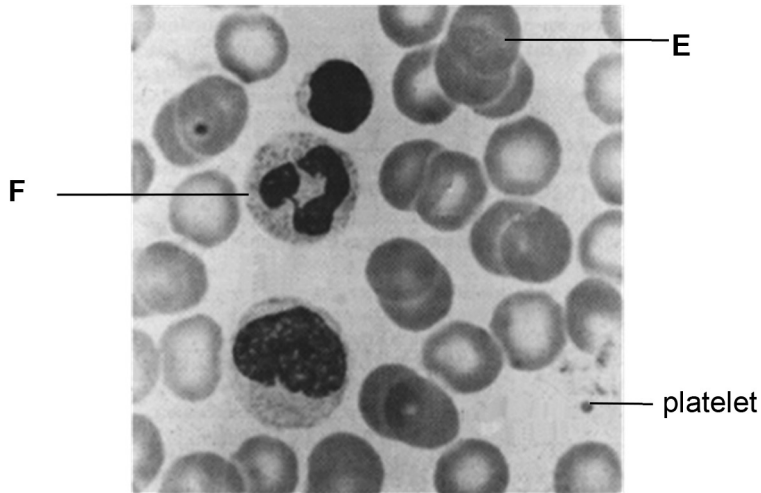


Fig. 7.1

(i) Name the cell labelled E.

..... [1]

(ii) State the function of the cell labelled F.

..... [1]

(iii) Describe how platelets bring about the clotting of blood.

.....
.....
..... [2]

(b) Fig. 7.2 is an illustration of stages of how immunity against the polio virus is achieved by the human body after a vaccination.

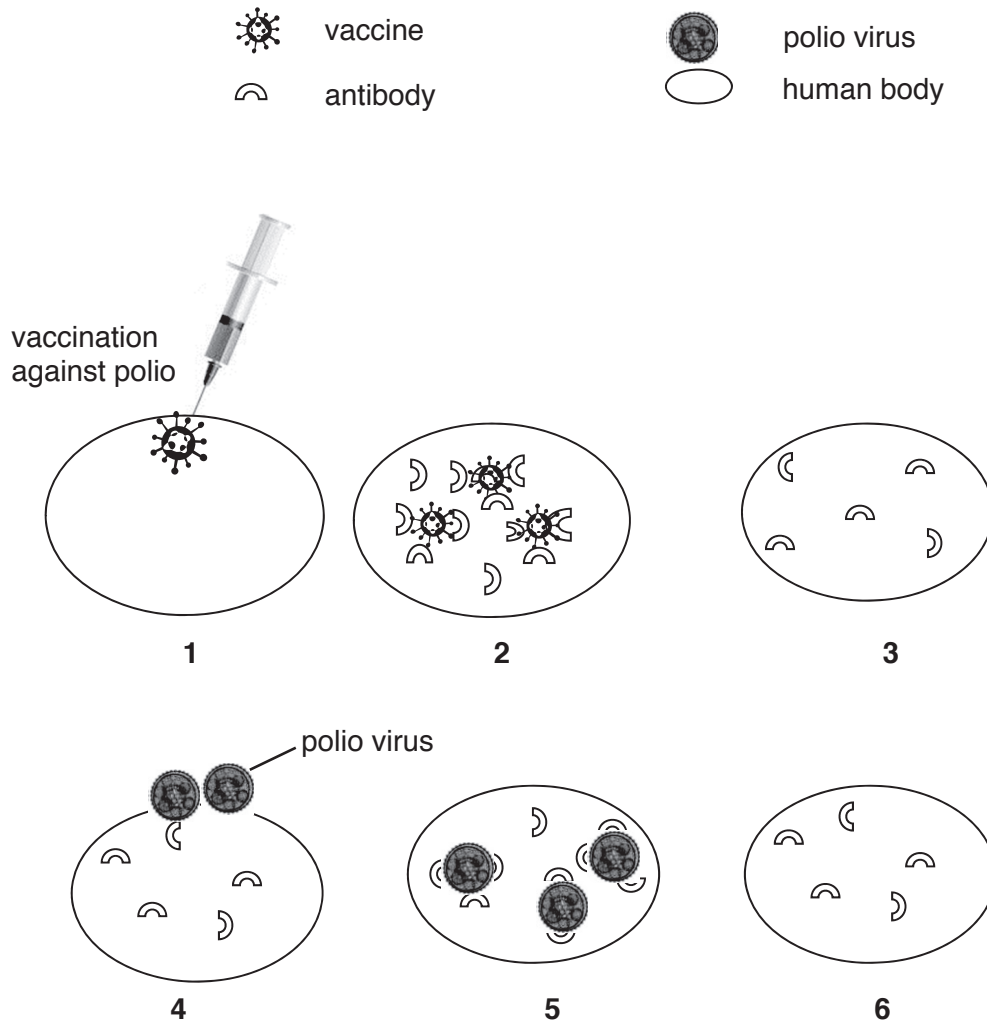


Fig. 7.2

(i) Define the term *pathogen*.

.....

..... [1]

(ii) Describe, using Fig. 7.2, the development of the immune response against the polio virus in each of the stages 1 to 6.

stage 1

.....
.....

stage 2

.....
.....

stage 3

.....
.....

stage 4

.....
.....

stage 5

.....
.....

stage 6

.....
.....

[6]

(iii) The illustration in Fig. 7.2 is an example of active immunity.

Describe how passive immunity is different from active immunity.

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

[2]

[Total: 13]

- 8 (a) Table 8.1 shows the concentration of protein, salt, glucose and urea in plasma, in glomerular filtrate and in urine.

Table 8.1

substance	concentration in g per dm ³		
	in plasma	in glomerular filtrate	in urine
protein	82.0	0.0	0.0
salt	8.0	8.0	16.5
glucose	0.9	0.9	4.0
urea	0.2	0.2	20.0

- (i) State which of the above substances is not filtered in the kidneys and explain why.

.....

 [2]

- (ii) Explain the mechanism that results in a higher concentration of urea in the urine than in the plasma.

.....

 [3]

- (iii) With reference to Table 8.1, suggest, with a reason, the medical condition that the person may have.

condition:

.....

reason:

.....
 [2]

(iv) Explain why a high concentration of glucose in the blood can harm body cells.

.....
.....
.....
..... [3]

(v) A kidney machine is used to assist patients who have kidney failure.

Explain how unwanted substances are removed through the dialysis tubing in the kidney machine.

.....
.....
..... [2]

(b) The body is able to control glucose concentration and temperature.

Describe how blood vessels lower the body temperature when the body is overheating.

.....
.....
.....
..... [2]

[Total: 14]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (ECESWA) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.