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5096/21

October/November 2010

2 hours

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 a pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the Question Paper.

You are advised to spend no longer than 1 hour on Section A.

Section B

Answer **all** the questions, including questions 8, 9 and 10 **Either** or 10 **Or**.

Write your answers in the spaces provided on the Question Paper.

Write an **E** (for Either) or an **O** (for Or) next to the number 10 in the

Write an $\square$ (for 'false') or an $\square$ (for 'true') next to the number 15 in Examiner's grid to indicate which question you have answered.

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		
Section A sub-total		
8		
9		
10		
Total		

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

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

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- 1 Fig. 1.1 shows stages **A**, **B** and **C** in the life cycle of an insect and the same insect transmitting the parasite that causes malaria to a new host.

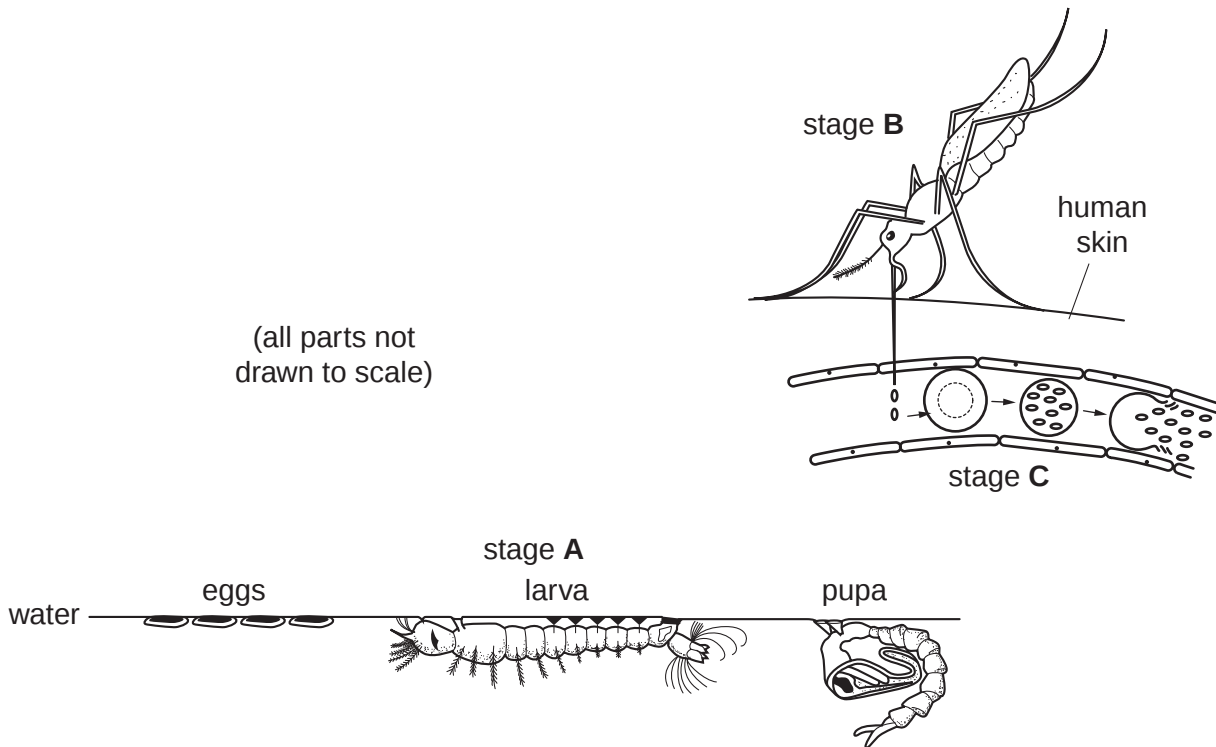


Fig. 1.1

- (a) (i) Name the organism that causes malaria. [1]

- (ii) State the name of the group to which this organism belongs.

..... [1]

- (b) (i) With reference to stage **B** in Fig.1.1, name the type of blood vessel and the type of blood cell shown.

blood vessel

blood cell [2]

- (ii) State the type of reproduction that the parasite is undergoing.

..... [1]

- (iii) State two signs or symptoms of malaria.

1

2

[2]

- (c) Different methods to control malaria can be used at different stages. For each of stages **A** and **B**, state **two** different methods, and for **C** state **one** method. For each method explain briefly how it controls the disease.

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	method	how it controls the disease
Stage A	1. 2.	1. 2.
Stage B	1. 2.	1. 2.
Stage C		

[10]

- (d) Explain why boiling water before drinking it provides protection against some diseases, but not against malaria.

.....

.....

.....

..... [3]

[Total: 20]

- 2 Sickle-cell anaemia is an inherited condition affecting red blood cells. People who have two dominant alleles for this condition have normal blood cells. A person who has one dominant and one recessive allele for the condition also has normal blood cells, but is better able to survive an attack of malaria.

In areas where malaria is prevalent, there is an increased risk of children being born with sickle-cell anaemia. Using **A** and **a** to represent the alleles, draw a labelled genetic diagram to explain why.

[Total: 4]

- 3 Fig. 3.1 shows the quantity of an antibiotic used in a hospital to treat a particular disease over an eleven-year period. It also shows the number of organisms responsible for this disease that survive the treatment.

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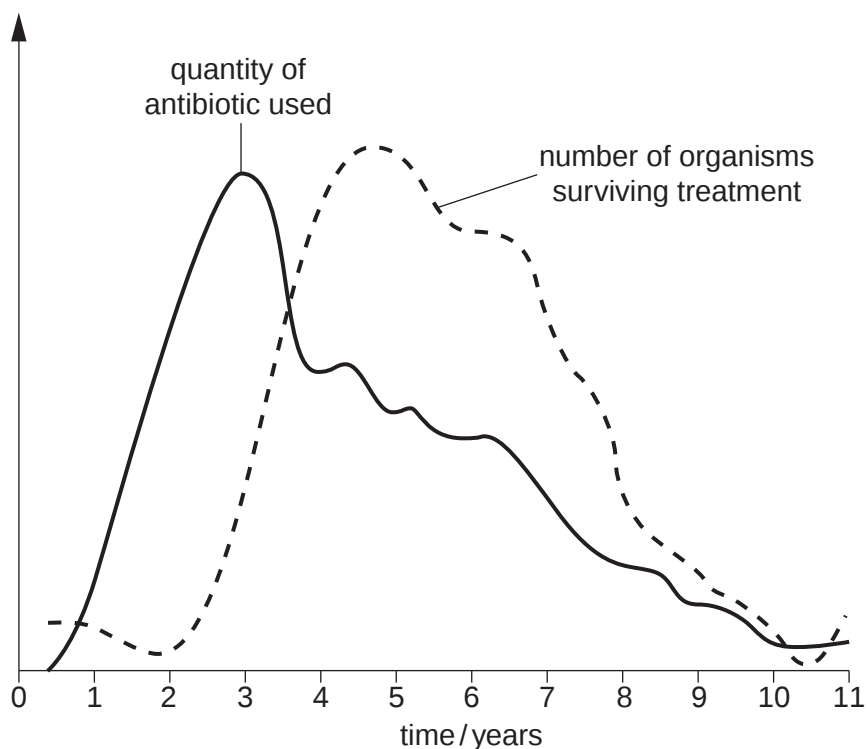


Fig. 3.1

- (a) Name the type of organism likely to be responsible for the disease that was being treated.

..... [1]

- (b) Suggest a possible disease and the name of an antibiotic that is used to treat it.

disease

antibiotic [1]

- (c) (i) Using only the information in Fig. 3.1, state a reason for the decreased use of the antibiotic.

..... [1]

- (ii) Suggest a way that the disease might be treated after year 11.

..... [1]

[Total: 4]

- 4 Drugs can be beneficial when properly used, but some people become drug dependent.

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(a) Define the term *drug dependence*.

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

(b) State two long-term effects that alcohol may have on the body.

1.
2. [2]

(c) Suggest how alcohol might affect the performance of a car driver.

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

[Total: 6]

- 5 Table 5.1 shows the recommended daily intake of energy and of certain nutrients for four different groups of people.

Table 5.1

	energy /MJ	protein /g	vitamin C /mg	vitamin D /μg	calcium /mg
child 2–4 yrs	6.0	35.0	20.0	10.0	500.0
moderately active man	12.6	75.0	30.0	2.5	500.0
pregnant woman	9.3	60.0	60.0	10.0	750.0
breast-feeding woman	10.2	68.0	60.0	10.0	1200.0

(a) State which nutrient in Table 5.1 is used for growth and repair.

..... [1]

- (b) Explain why a woman who is breast-feeding and an adult man require different quantities of the following nutrients:

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vitamin C,

.....

.....

vitamin D,

.....

.....

calcium.

.....

..... [4]

- (c) Suggest an explanation for the difference in calcium requirements between a woman who is pregnant and one who is breast-feeding.

.....

..... [1]

[Total: 6]

- 6 Fig. 6.1 shows how the concentration of blood glucose is controlled.

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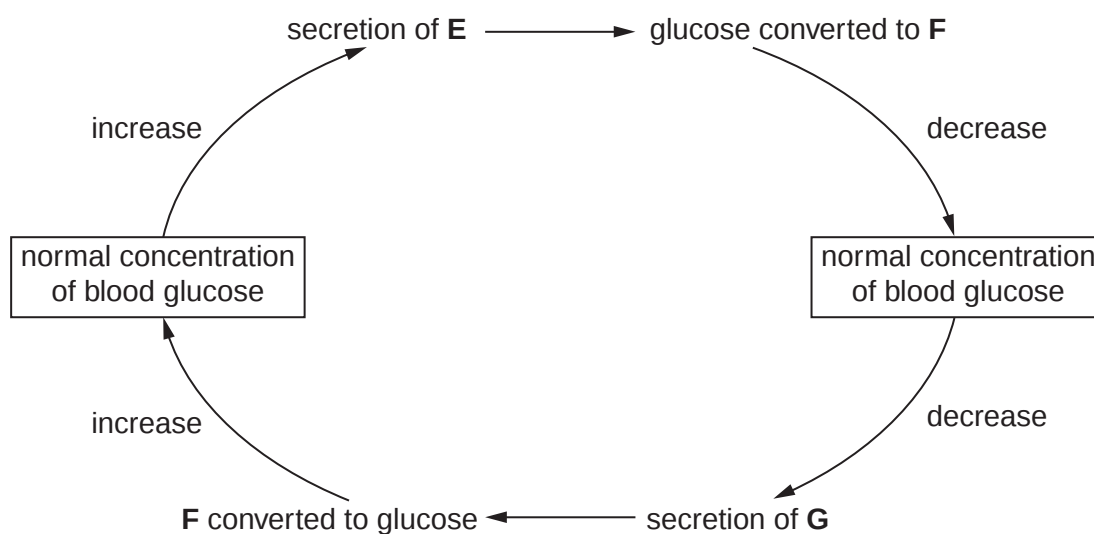


Fig. 6.1

- (a) State the type of process occurring in the body that is shown by Fig. 6.1.

..... [1]

- (b) Identify **E**, **F**, and **G** in Fig. 6.1.

E

F

G

[3]

- (c) Name the gland that secretes **E** and **G**.

[1]

[Total: 5]

- 7 Fig. 7.1 is a graph that shows the flow of air into and out of a person's lungs over a period of 112 seconds.

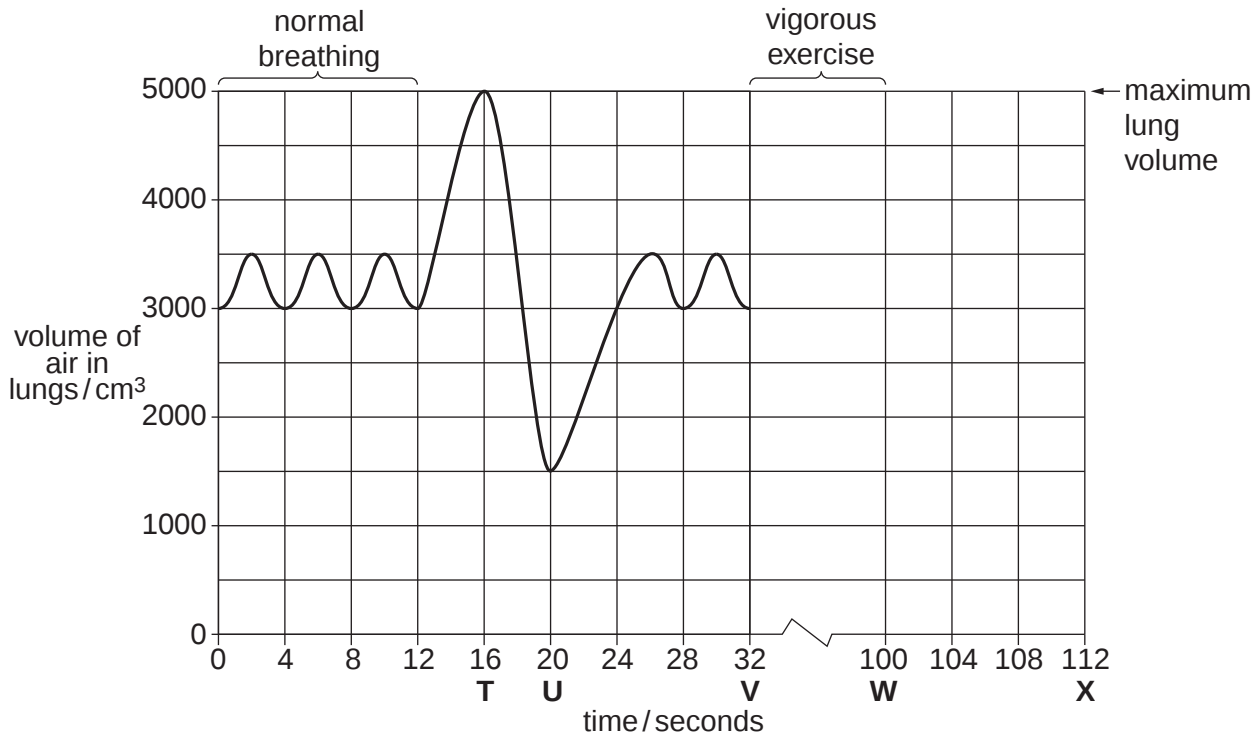


Fig. 7.1

- (a) State the volume of air expelled by the person after taking in a full breath then breathing out as much as possible.

..... [2]

- (b) Name the muscles used in breathing. For each muscle, describe its action between time **T** and time **U** on Fig. 7.1.

.....

.....

.....

.....

.....

.....

..... [3]

- (c) The person took strenuous exercise between time **V** and time **W**. Complete Fig. 7.1 to show what would happen to their breathing from **W** to **X**.

[2]

- (d) Explain why strenuous exercise causes the changes to breathing that you have shown in your answer to (c).

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.....

.....

.....

..... [3]

[Total: 10]

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8 (a) Describe how the structure of cartilage differs from that of bone.

..... [4]

[11

- 9 (a) State and explain the importance of the kidneys.

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..... [7]

- (b) Describe how the work of the kidneys is affected by changes in

- (i) diet,

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..... [4]

- (ii) atmospheric temperature.

.....

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.....

..... [4]

(a) Discuss the importance of personal hygiene and of the sanitary disposal of human bodily waste.

[9]

[9]

-

- [6]

[6]

10 Or

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(a) Discuss the dangers of allowing domestic waste to accumulate.

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..... [5]

(b) Describe the large-scale treatment of sewage.

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..... [10]

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