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4984188315

BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2023**

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

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1 Fig. 1.1 shows a photograph of a pseudoscorpion.

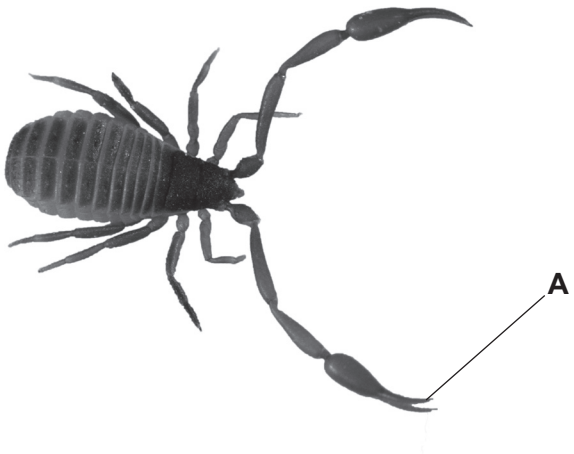


Fig. 1.1

(a) (i) State **two** features, **visible** in Fig. 1.1, that can be used to classify this organism as an arachnid.

1 .....

2 .....
[2]

(ii) State the kingdom that arachnids belong to.

..... [1]

(b) (i) Complete the definition of the term adaptive feature by inserting the missing words.

An adaptive feature is an ..... feature that helps an organism to

..... and ..... in its environment.
[3]

(ii) The part labelled **A** in Fig. 1.1 is an adaptive feature of the pseudoscorpion.

Suggest a function of the part labelled **A** in Fig. 1.1.

.....

.....

..... [1]

[Total: 7]

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2 **(a)** Fig. 2.1 is a diagram showing some of the structures found in a plant cell.

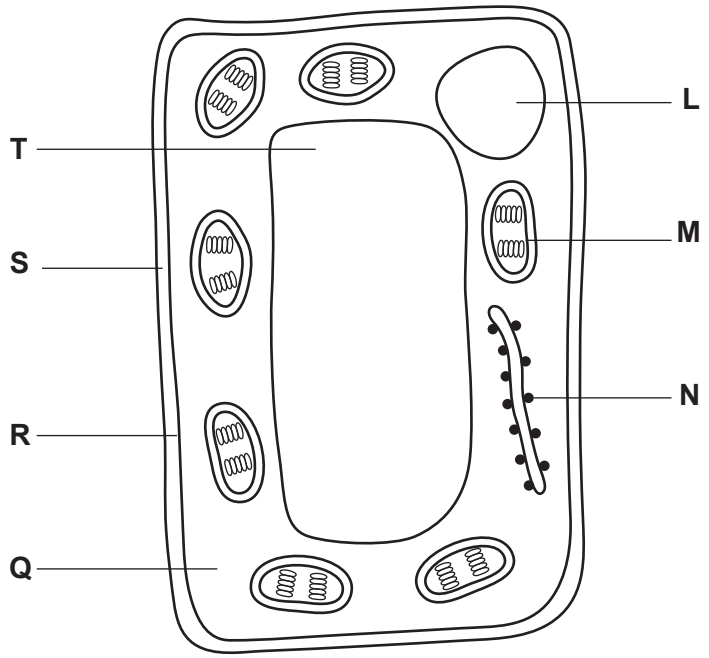


Fig. 2.1

Table 2.1 shows the names of some plant cell structures, their functions and the letters that identify them in Fig. 2.1.

Complete Table 2.1 by writing the missing name, letters and functions in the spaces provided.

Table 2.1

name of structure	letter from Fig. 2.1	**one** function
chloroplast		site of photosynthesis
ribosome	**N**	
cell wall		prevents the cell bursting
	L	

[5]

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(b) (i) State the name of **one** cell structure that is found in plant cells but **not** in animal cells.

..... [1]

(ii) State the name of **one** cell structure that is found in plant cells **and** in animal cells.

..... [1]

(c) Fig. 2.2 is a diagram of a specialised plant cell.

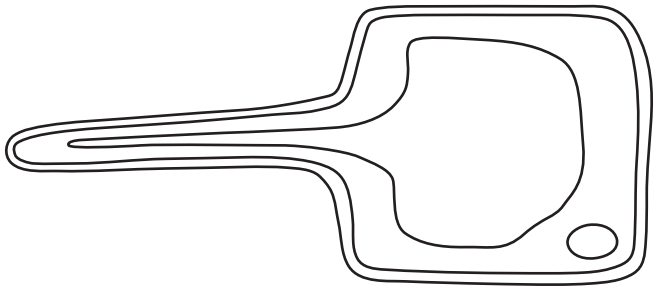


Fig. 2.2

State the name of the cell shown in Fig. 2.2 and describe how it is adapted for its function.

.....

.....

.....

.....

..... [3]

[Total: 10]

3 **(a)** Fig. 3.1 shows the action of an enzyme.

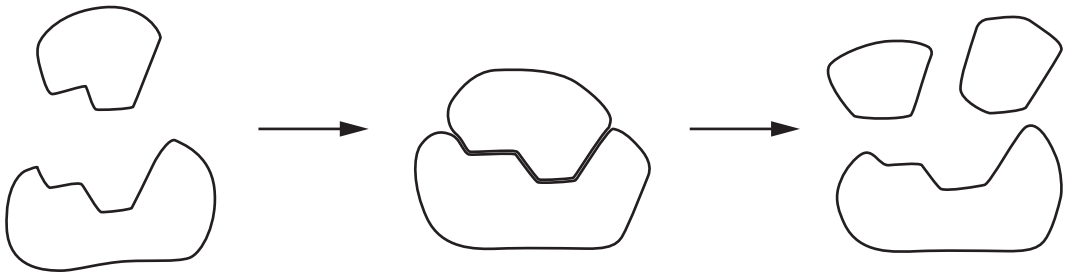


Fig. 3.1

On Fig. 3.1 use label lines and labels to identify:
- an enzyme
- a product
- a substrate.

[3]

(b) Describe what is meant by the term enzyme.

.....

.....

..... [2]

(c) The enzymes in biological washing powders speed up the removal of stains from clothing.

Some of these stains may contain fats.

(i) (Circle) the name of the enzyme that will remove fat stains.

amylase **lipase** **pectinase** **protease**

[1]

(ii) Explain why removing fat stains and protein stains from clothing requires a washing powder that contains more than one type of enzyme.

.....

.....

.....

.....

..... [2]

(d) An investigation was carried out to compare how fast a biological washing powder removed stains at different temperatures.

Fig. 3.2 shows the results of the investigation.

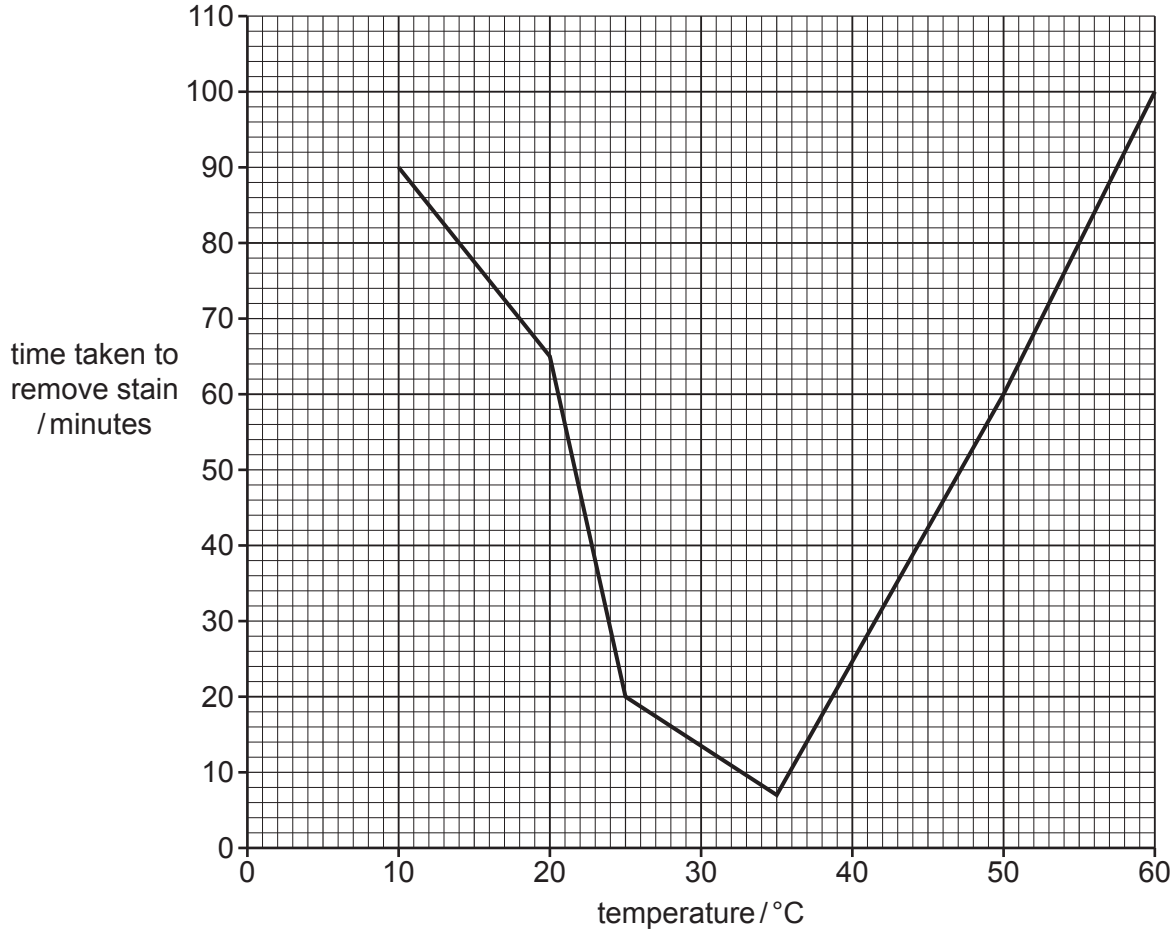


Fig. 3.2

Using the information in Fig. 3.2:

(i) State the optimum temperature for the washing powder.

..... °C [1]

(ii) State the time taken for the washing powder to remove the stain at 20 °C.

..... minutes [1]

(iii) Describe what happens to the enzymes in the biological washing powder between 40 °C and 60 °C.

.....

.....

.....

..... [2]

[Total: 12]

4 **(a)** A balanced diet includes foods that contain calcium ions.

(i) (Circle) the food that has the highest calcium content.

cheese **egg** **orange** **potato**

[1]

(ii) Table 4.1 shows the recommended calcium intake for different age groups.

Table 4.1

age group in years	recommended calcium intake / mg per day
0–3	500
4–8	800
9–18	1300
19–50	1000
51+	1200

The list shows five statements about the data in Table 4.1.

Tick (✓) **two** statements that are correct descriptions of the data shown in Table 4.1.

Age group 51+ has the highest recommended daily intake of calcium.	
As age increases, the recommended daily intake of calcium decreases.	
As age increases, the recommended daily intake of calcium increases, then decreases and then increases again.	
The recommended daily intake of calcium doubles from ages 0–3 to ages 19–50.	
The recommended daily intake of calcium is higher at ages 19–50 than at ages 9–18.	

[2]

(iii) Suggest reasons why some age groups need more calcium in their diet than others.

.....

.....

.....

.....

..... [2]

(b) Some diseases are caused by an unbalanced diet.

The boxes on the left contain the names of two diseases.

The boxes on the right contain some sentence endings.

Draw **one** straight line from each box on the left to a box on the right to make **two** correct sentences.

	is caused by a lack of carbohydrate.
Rickets	
	is caused by a lack of iron.
	is caused by a lack of vitamin C.
Scurvy	
	is caused by a lack of vitamin D.

[2]

(c) **(i)** State **one** dietary source of fibre.

..... [1]

(ii) Describe the importance of fibre in the diet.

.....

.....

..... [1]

(d) Fig. 4.1 is a diagram of part of the digestive system.

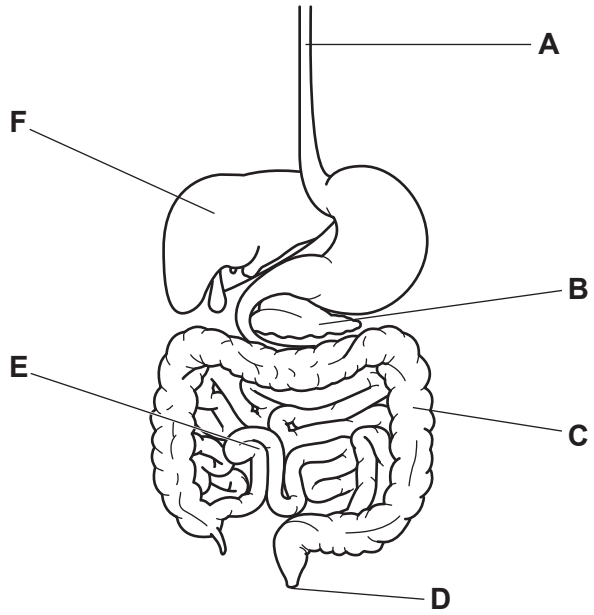


Fig. 4.1

(i) State **one** letter, from Fig. 4.1, that labels the part of the digestive system where egestion occurs.

..... [1]

(ii) State the **two** letters from Fig. 4.1 that label the parts of the digestive system where water is absorbed.

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

[Total: 12]

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5 **(a)** Complete the sentences about anaerobic respiration in **humans**, using words or phrases from the list.

You may use the words or phrases once, more than once or not at all.

alcohol **breaks down** **builds up** **carbon dioxide**

element **lactic acid** **less** **molecule** **more**

muscles **particle** **oxygen** **releases**

Anaerobic respiration is the chemical reaction in cells that ..... nutrient molecules to release energy without using ..... .

Anaerobic respiration releases much ..... energy per glucose ..... than aerobic respiration.

..... is produced by anaerobic respiration during vigorous exercise.

[5]

(b) Complete the word equation for anaerobic respiration in **yeast**.

glucose ⟶ ..... + ...

[2]

[Total: 7]

6 **(a)** The eye is a sense organ that contains receptor cells that respond to light.

State **three** other stimuli that sense organs respond to.

1 .....

2 .....

3 .....

[3]

(b) Fig. 6.1 shows a section through the human eye.

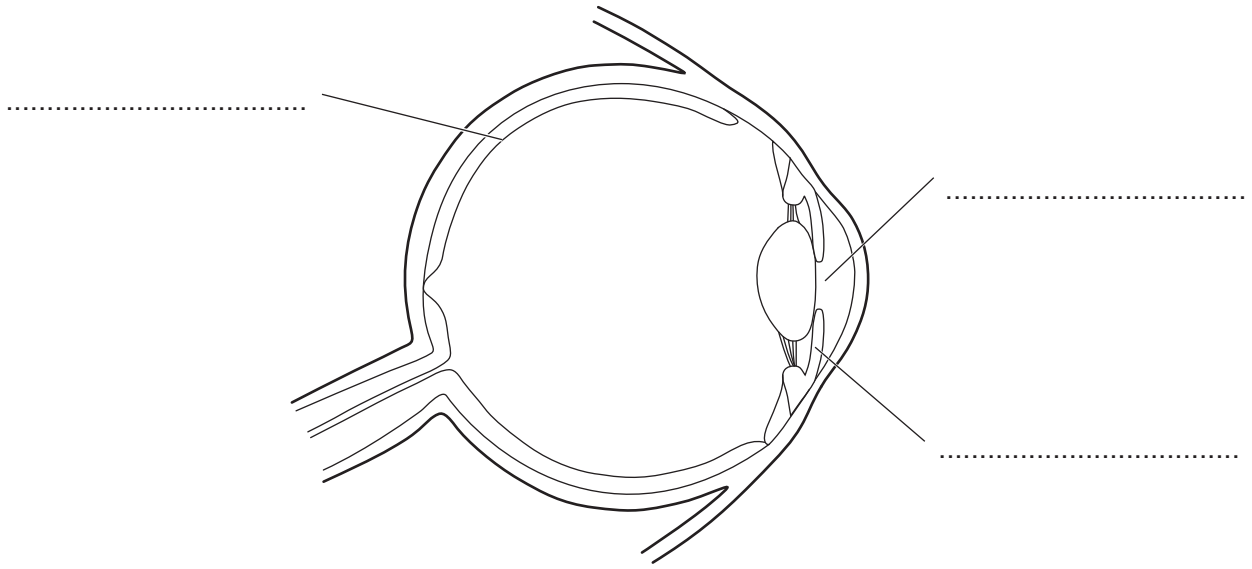


Fig. 6.1

(i) State the names of the structures labelled on Fig. 6.1.

Write your answers in the spaces provided. [3]

(ii) Draw an **X on Fig. 6.1** to show the location of the blind spot. [1]

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(c) (i) The sentences describe some of the events that occur when the eye responds to light.

Complete the sentences using the words from the list.

Each word may be used once, more than once or not at all.

absorbed **brain** **glands** **lens** **muscles**

pupil **receptors** **reflected** **refracted**

Rays of light reach the front of the eye. Light is ..... through the cornea and the ..... focuses light on the retina. Light ..... in the retina detect light and the optic nerve carries impulses to the ..... .

[4]

(ii) State what happens to the pupil's diameter in a person's eye when they move from a bright room to a dark room.

..... [1]

[Total: 12]

7 **(a)** A farmer wanted to use selective breeding to produce goats with a high milk yield.

Fig. 7.1 shows a goat being milked.

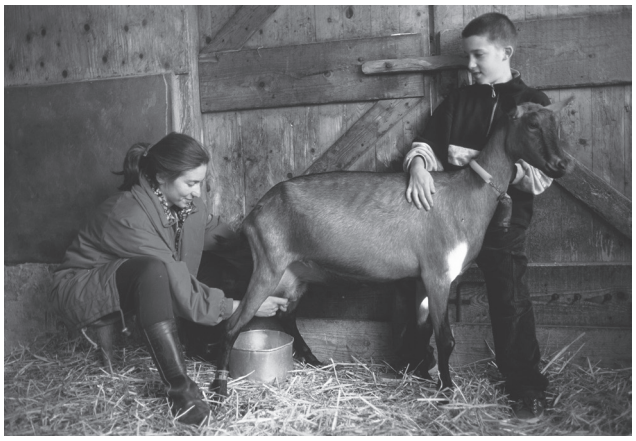


Fig. 7.1

Describe the stages in selective breeding to develop goats with a high milk yield.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Animals can be farmed intensively.

State **two** advantages of intensive livestock production.

1 .....

.....

2 .....

.....

[2]

[Total: 5]

8 **(a)** Explain the importance of the acrosome and the mitochondria for the function of sperm cells.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) Table 8.1 shows some features of egg cells and sperm cells in humans.

Complete Table 8.1 by stating the differences between egg cell and sperm cell size, motility and numbers produced.

Table 8.1

feature	egg cell	sperm cell
relative size		
motility		
numbers produced		

[3]

(c) At birth, a human female has approximately 1.5 million eggs in her ovaries.

By puberty only about 350 000 remain in the ovaries.

Calculate the percentage decrease in the number of eggs between birth and puberty.

Give your answer to **one** decimal place.

Space for working.

..... %
[3]

(d) Fig. 8.1 is a diagram of a fetus developing in a uterus.

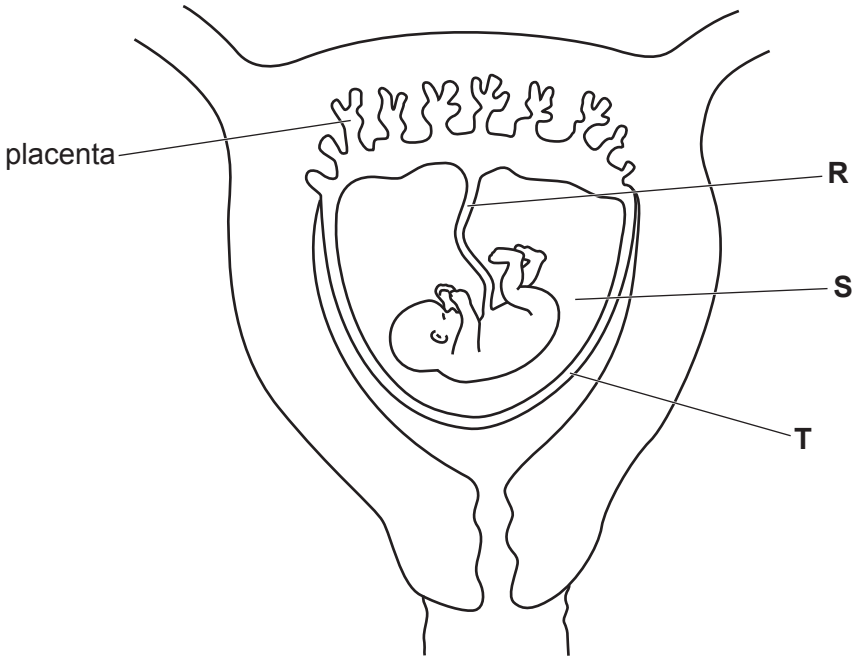


Fig. 8.1

(i) State the name of the part labelled **T** in Fig. 8.1.

..... [1]

(ii) State the functions of the parts labelled **R** and **S** in Fig. 8.1.

R .....

.....

S .....

.....
[2]

(iii) Describe the functions of the placenta.

.....

.....

.....

.....

..... [2]

[Total: 15]

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