Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/32**

Paper 3 Theory (Core) **October/November 2022**

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 **(a)** Fig. 1.1 is a branching key that can be used to identify different types of crustaceans.

View solution

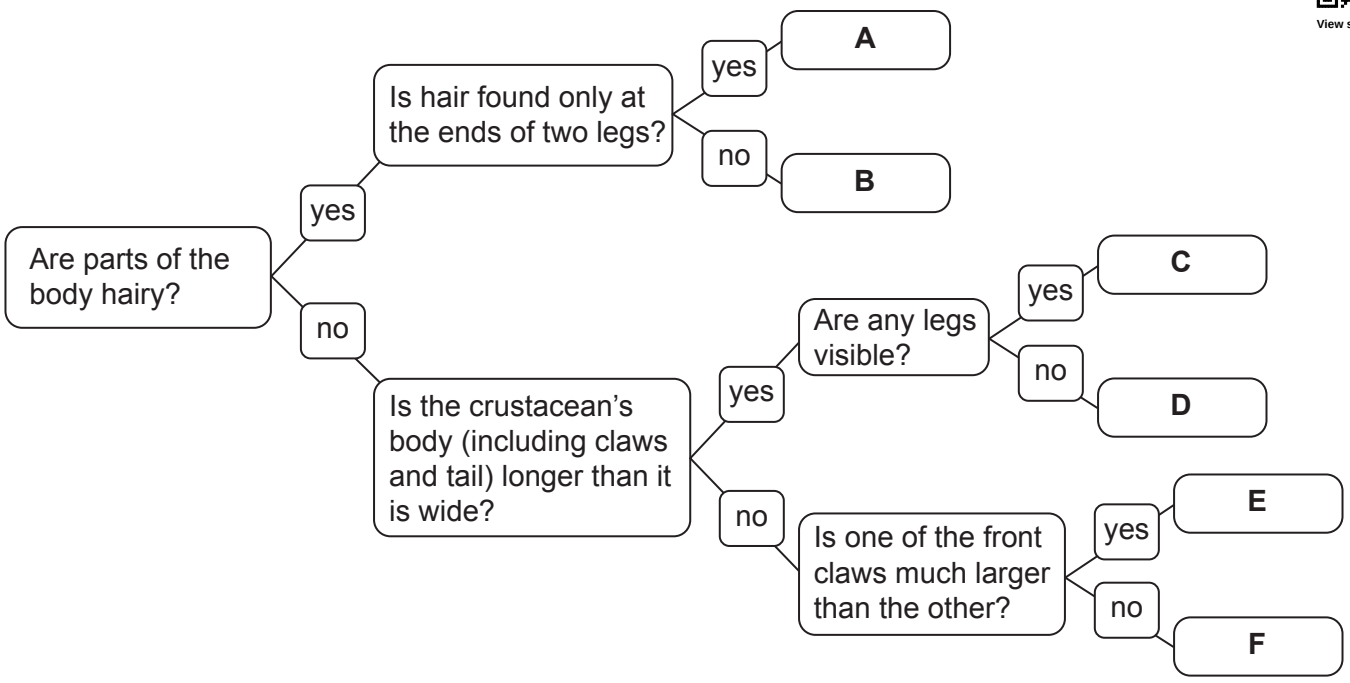

Fig. 1.1

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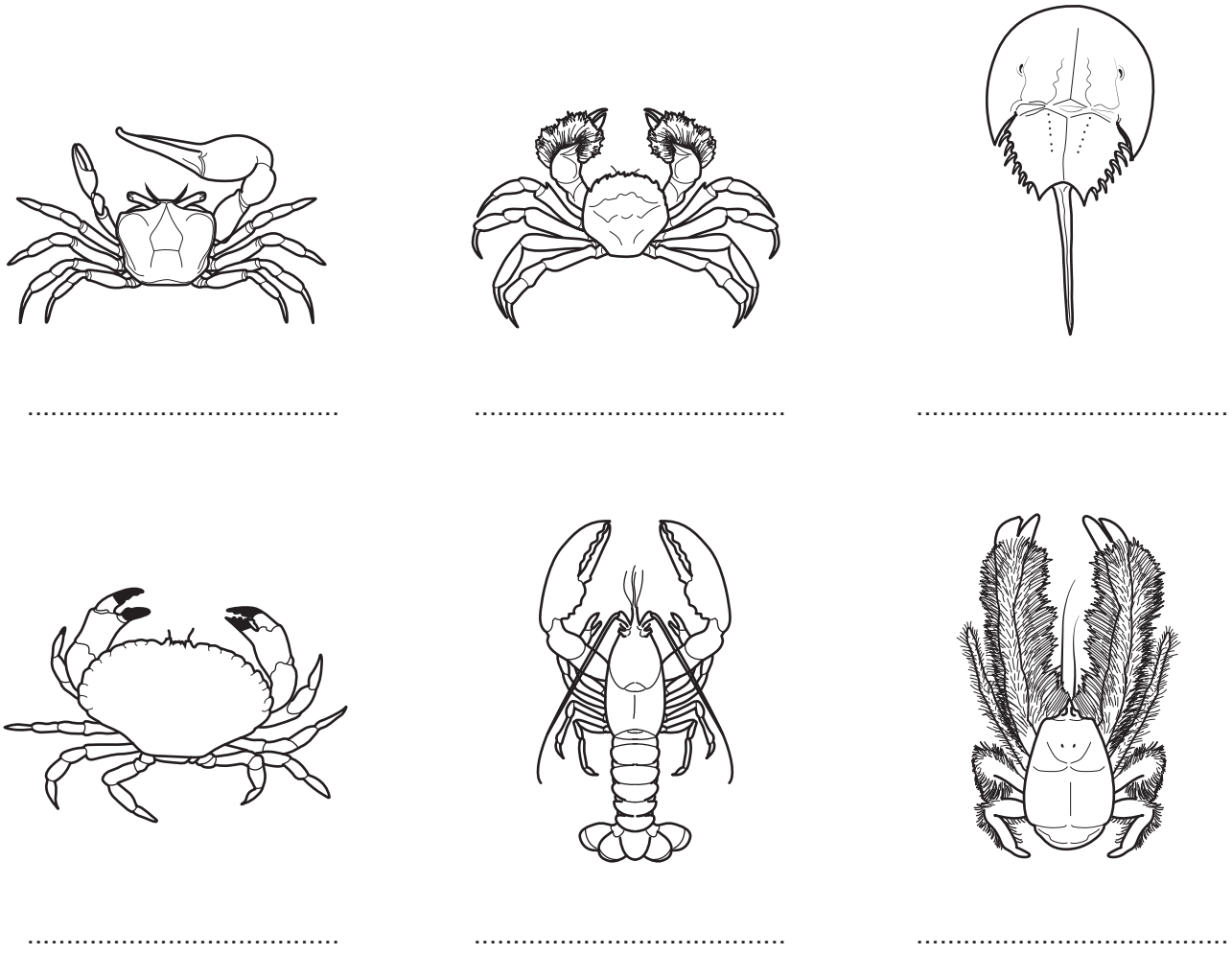
Fig. 1.2 shows six crustaceans.

Use the key in Fig. 1.1 to identify the six different types of crustacean.

Write the letters on the lines in Fig. 1.2.



....

....

Fig. 1.2 [5]

(b) Crustaceans are one group of arthropods.

State the names of **two other** groups of arthropods.

1 .....

2 .....

[2]

(c) Describe **one** way in which all vertebrates differ from arthropods.

.....

.....

..... [1]

[Total: 8]

2 **(a)** Fig. 2.1 is a photomicrograph of human blood.

View solution

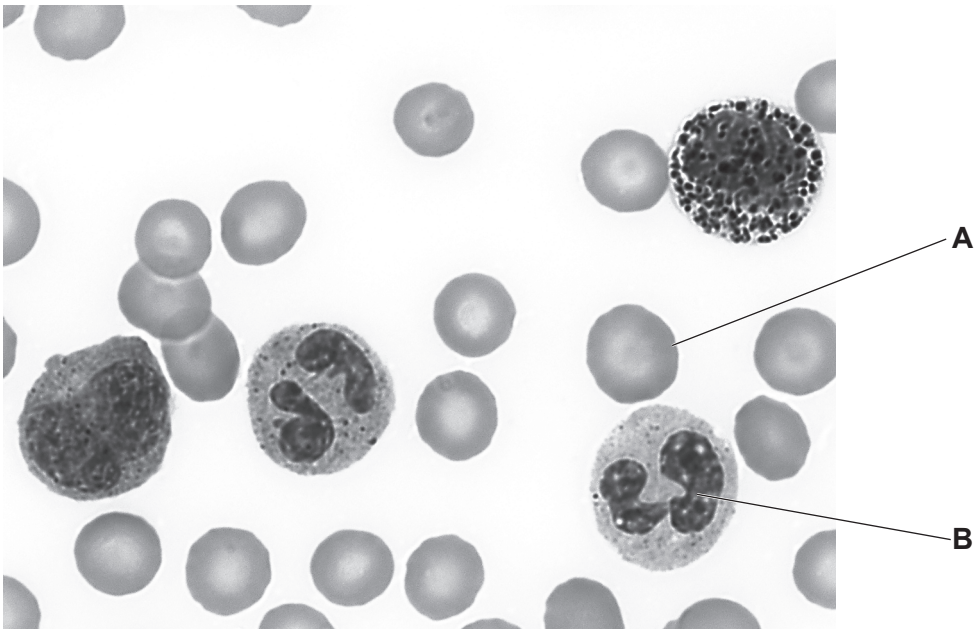


Fig. 2.1

(i) Use the information in Fig. 2.1 to complete Table 2.1 by stating **one** function for each cell.

Table 2.1

identifying letter in Fig. 2.1	function
A	
B	

[2]

(ii) State the name of the component of blood that transports the cells shown in Fig. 2.1.

..... [1]

View solution

(b) Table 2.2 shows some of the features of diffusion, osmosis and active transport.

View solution

Place ticks (✓) in the boxes to show the correct features of each process.

Table 2.2

	requires energy from respiration	takes place against a concentration gradient	always involves the movement of water	substances can cross the cell membrane
diffusion				
osmosis				
active transport				

[4]

[Total: 7]

3 **(a)** The population of leatherback turtles in one part of the Pacific Ocean was monitored over several years.

View solution

The population numbers were estimated and the results are shown in Fig. 3.1.

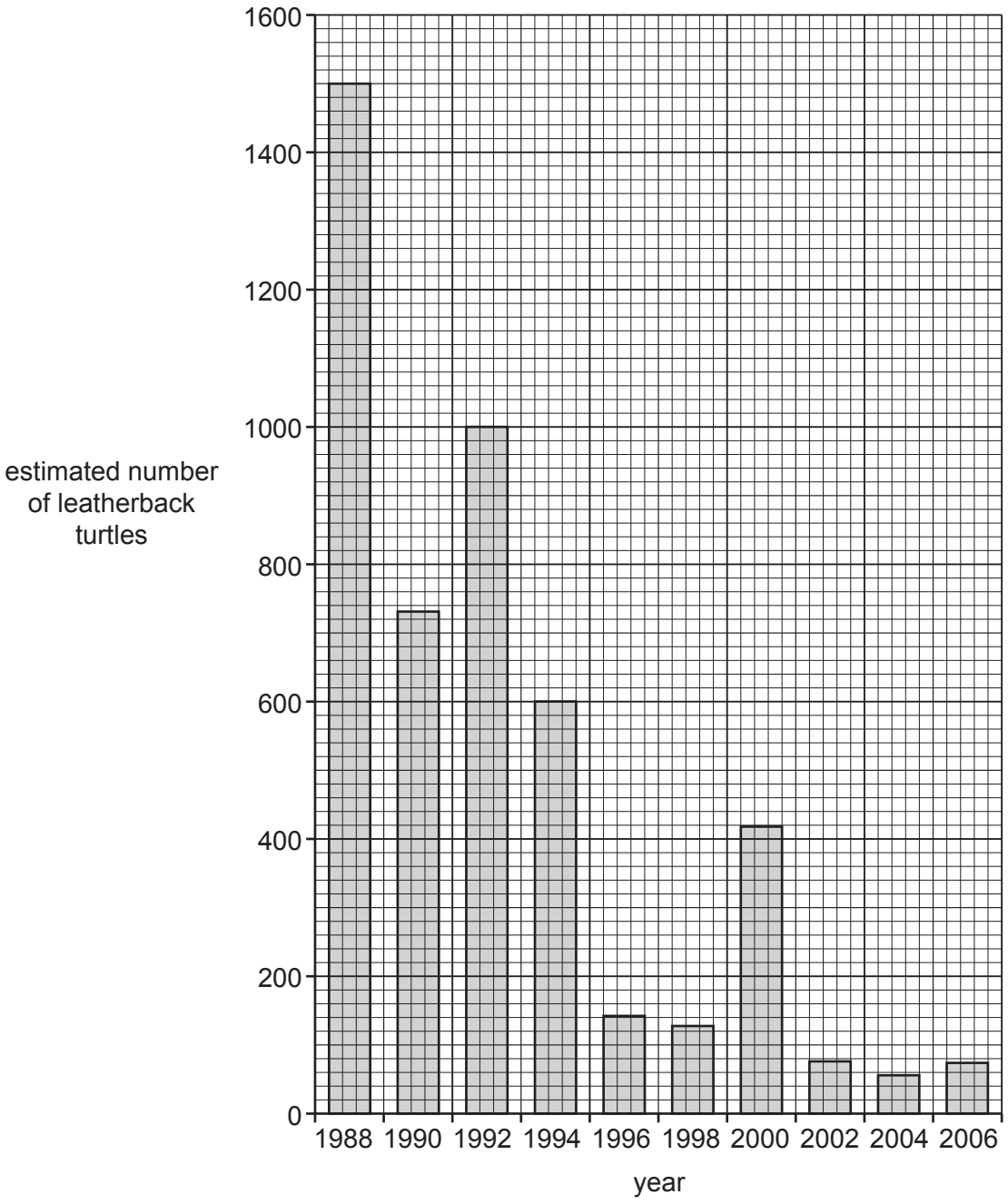


Fig. 3.1

(i) State the year with the lowest estimated number of leatherback turtles shown in Fig. 3.1.

..... [1]

(ii) Using the information in Fig. 3.1, calculate the percentage decrease in the number of turtles between 1988 and 1994.

View solution

Space for working.

..... %
[2]

(b) One reason for the decrease in population numbers of leatherback turtles is pollution by discarded rubbish such as plastics.

View solution

State **two** ways in which the amount of plastic pollution can be reduced.

1 .....

.....

2 .....

.....
[2]

(c) Suggest other factors, apart from pollution, that can lead to a decrease in the population of leatherback turtles.

.....

.....

.....

.....

.....

.....

..... [3]

(d) Plastic is a non-sustainable resource that is made from fossil fuels.

View solution

Complete the sentence to define a sustainable resource.

A sustainable resource is one which is ..... as rapidly as it is removed from the environment so that it does not ..... .

[2]

[Total: 10]

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4 **(a)** Fig. 4.1 shows the structure of a human tooth.

View solution

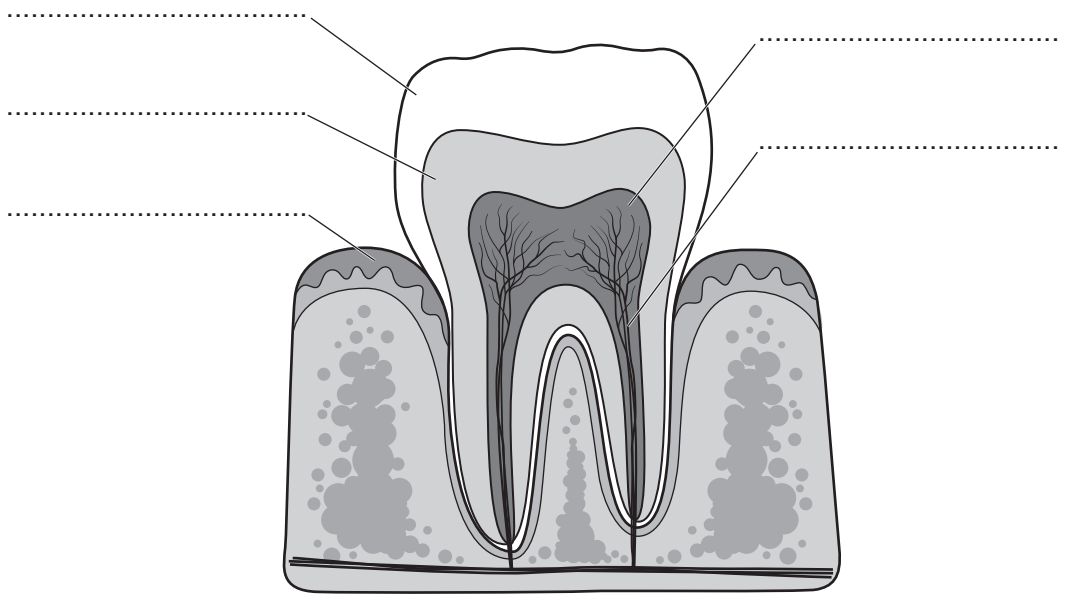

Fig. 4.1

Complete Fig. 4.1 by labelling the parts, in the spaces provided, using words from the list.

dentine **enamel** **gum** **nerves** **pulp**

[4]

(b) State the names of **two** types of human teeth.

View solution

1 .....

2 .....

[2]

(c) Describe the causes of dental decay.

View solution

.....

.....

.....

.....

.....

.....

..... [3]

(d) Describe **two** ways of caring for teeth.

View solution

1 .....

.....

2 .....

.....

[2]

(e) State the type of digestion that teeth are involved in.

..... [1]

[Total: 12]

View solution

5 **(a)** Fig. 5.1 is a diagram of some of the organs involved in the production and release of urine.

View solution

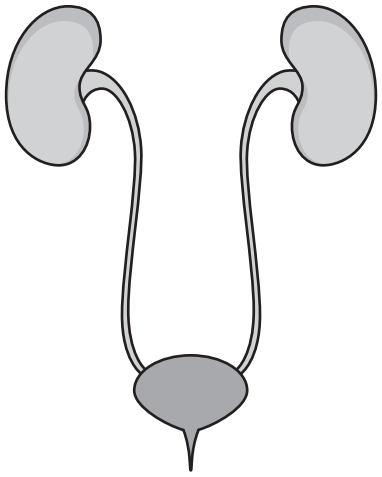

Fig. 5.1

Draw an **X** on Fig. 5.1 to identify the position of the bladder. [1]

(b) A scientist recorded the volume of urine released by different species of mammal during a 24-hour period.

View solution

The scientist collected urine from five individuals of each species of mammal.

The highest and lowest volumes of urine released were recorded to give a range for each species of mammal.

Table 5.1 shows the results.

Table 5.1

species of mammal	range of volumes of urine released in 24 hours / dm^3
A	2.10 – 12.60
B	15.30 – 40.50
C	0.08 – 0.16
D	1.00 – 2.00
E	0.60 – 2.40

(i) State the species of mammal that released the lowest volume of urine in Table 5.1.

..... [1]

(ii) State the species of mammal that has the largest range shown in Table 5.1.

..... [1]

View solution

(c) Explain why the volume of urine produced in humans can vary throughout the day. View solution

.....

.....

.....

.....

.....

.....

..... [3]

(d) Urine contains urea, excess water and excess ions. View solution

The list shows some organs.

kidney **liver** **ureter**

urethra **vagina**

(i) State the name of the organ from the list that produces urea.

..... [1]

(ii) State the name of the organ from the list that excretes urea. View solution

..... [1]

(e) State the name of the gas that is excreted through the lungs.

..... [1]

[Total: 9]

View solution

6 Respiration occurs in all living organisms.

(a) State the name of the product of **anaerobic** respiration in humans.

View solution

..... [1]

(b) **(i)** Table 6.1 shows the energy released during the aerobic and anaerobic respiration of one molecule of glucose in humans.

View solution

Table 6.1

type of respiration	energy released / kJ
aerobic	2872
anaerobic	118

Calculate the difference in energy released between aerobic and anaerobic respiration.

..... kJ [1]

(ii) State the word equation for **aerobic** respiration.

..... [2]

View solution

(c) Biofuels can be made from ethanol which is a type of alcohol.

View solution

Ethanol is produced during anaerobic respiration in yeast.

The volume of biofuels produced by seven countries was measured.

Fig. 6.1 shows the percentage of biofuels produced by each country.

The countries are labelled **A** to **G**.

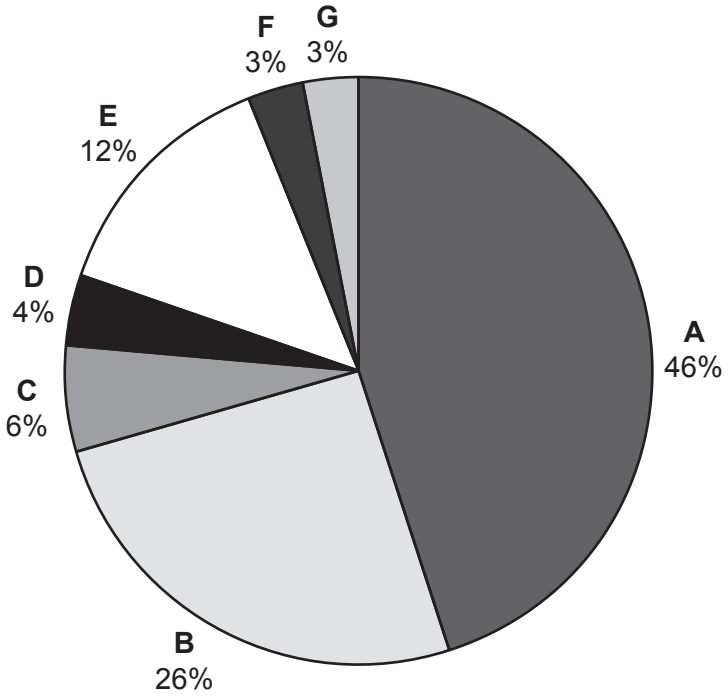

Fig. 6.1

(i) Complete the sentences to describe the results shown in Fig. 6.1.

Country ..... produces the largest percentage of biofuels.

Countries ..... and ..... produce the smallest percentages of biofuels.

Country **E** produces twice as much biofuel as country ..... .

[4]

(ii) State the name of **one** product of anaerobic respiration in yeast, other than alcohol.

..... [1]

(iii) State **one** use by humans of anaerobic respiration in yeast, other than to produce biofuels.

..... [1]

[Total: 10]

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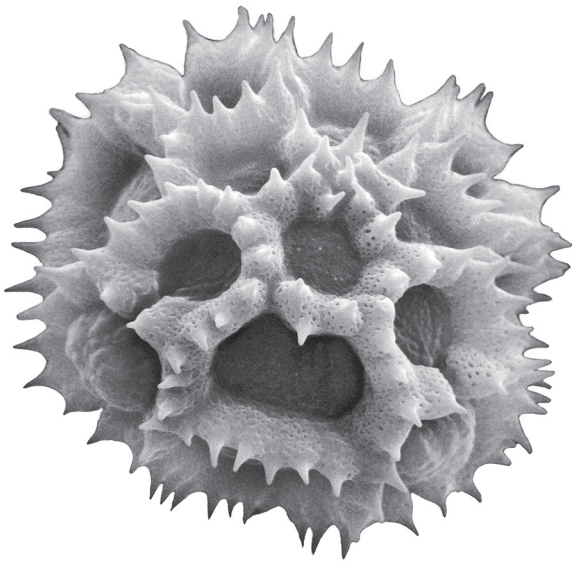
7 **(a)** Fig. 7.1 is a photomicrograph of pollen from an insect-pollinated plant.

View solution



magnification ×2500

Fig. 7.1

Describe **two** ways the pollen from a wind-pollinated plant differs from the type of pollen shown in Fig. 7.1.

1 .....

.....

2 .....

.....

[2]

(b) Fig. 7.2 is a diagram of a section through an insect-pollinated flower.

View solution

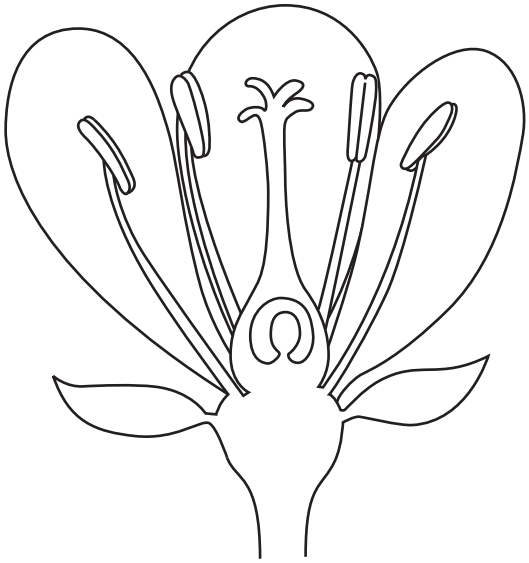


Fig. 7.2

On Fig. 7.2:

- draw an **X** to show where fertilisation occurs
- **circle** the part where pollination occurs
- draw a label line and label the part that produces pollen with the correct name.

[4]

(c) Plants grow from seeds.

View solution

State **two** conditions required for the germination of seeds.

1 .....

2 .....

[2]

(d) Xylem tissue is used for transport and support in plants.

View solution

Describe how the structure of xylem tissue is adapted for these functions.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

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8 Table 8.1 shows the levels of organisation in living organisms and some examples.

View solution

Place ticks (✓) in the boxes to show the correct level of organisation for each example.

Table 8.1

example	level of organisation				
	cell	tissue	organ	organ system	organism
circulatory					
epidermis					
pancreas					
tree					
sperm					

[5]

9 **(a)** Fig. 9.1 contains some information about a reflex action.

View solution

A person touches a hot pan.
Electrical impulses travel to the central nervous system which coordinates a response.
The muscles in the arm contract quickly.

Fig. 9.1

(i) State the name of the stimulus from the example given in Fig. 9.1.

..... [1]

(ii) State the name of the effector from the example given in Fig. 9.1.

View solution

..... [1]

(iii) State the names of the **two** parts of the central nervous system.

View solution

1 .....

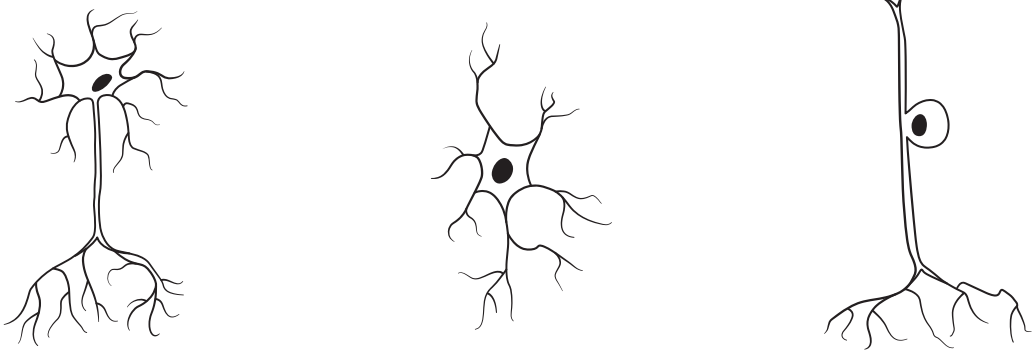
2 .....

[2]

(b) Fig. 9.2 shows diagrams of three types of neurones.

View solution

State the names of the three types of neurones on the lines provided in Fig. 9.2.



....

not to scale

Fig. 9.2

[3]

(c) State the name given to the junction between two neurones.

View solution

..... [1]

[Total: 8]

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