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CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

3176963012

BIOLOGY **0610/32**

Paper 3 Theory (Core) **October/November 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 **(a)** Fig. 1.1 is a diagram of the digestive system.

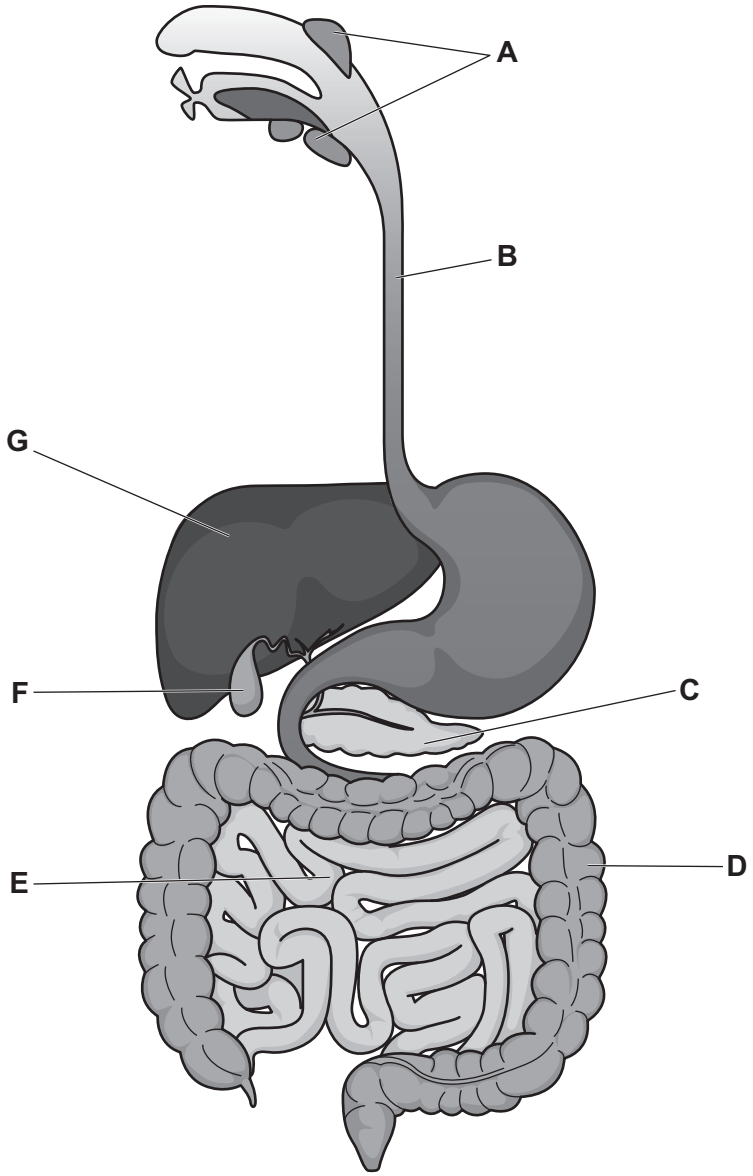

Fig. 1.1

(i) State the letter from Fig. 1.1 that represents:

where salivary amylase is produced .....

where insulin is produced .....

the liver .....

where protease acts. .....

[4]

(ii) State **one** function of the hydrochloric acid in the stomach.

.....

.....

..... [1]

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(b) Amylase is an enzyme.

(i) Describe the function of amylase.

.....

.....

..... [2]

(ii) Define the term enzyme.

.....

.....

..... [2]

[Total: 9]

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2 A student investigated photosynthesis in a variegated leaf.

A variegated leaf has a green part that contains a green pigment and a white part that does not contain the green pigment.

Fig. 2.1 is a photograph of some variegated leaves.

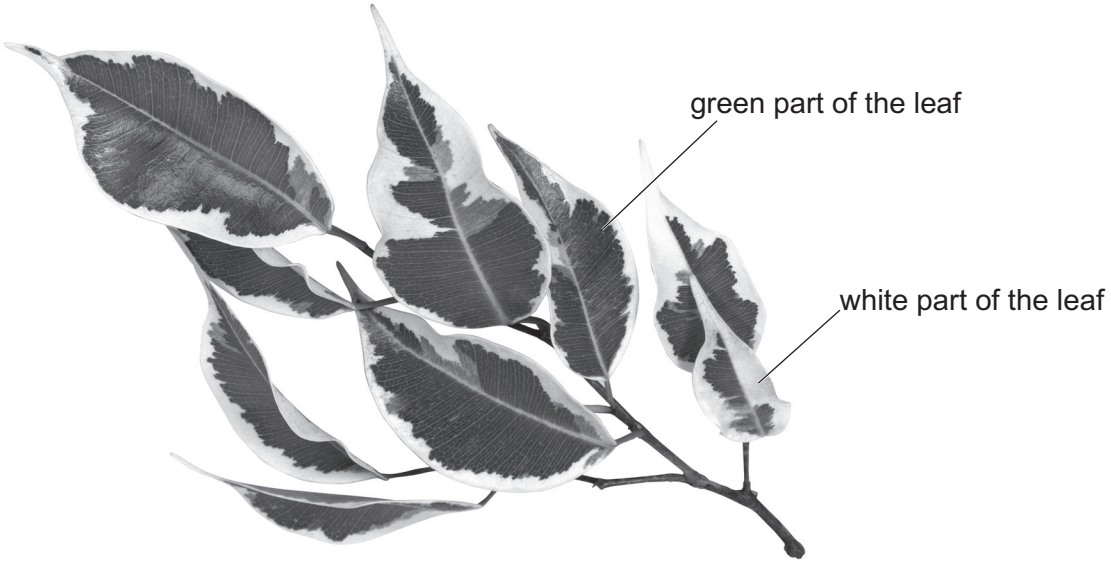

Fig. 2.1

(a) State where the green pigment is found in a plant cell.

..... [1]

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(b) A student investigated a variegated leaf from a plant that had been kept in the light for 24 hours.

The student prepared the leaf by boiling it and then placing it in ethanol to remove the green pigment.

The student then tested the leaf with iodine solution.

Table 2.1 shows the results.

Table 2.1

part of the leaf	colour with iodine solution
green	blue-black
white	yellow-brown

Explain the results shown in Table 2.1 for the white part of the leaf.

.....

.....

.....

.....

.....

.....

..... [3]

(c) This investigation was repeated with a plant that was kept for 24 hours in an environment where all the carbon dioxide was removed.

Complete Table 2.2 to predict the results.

Table 2.2

part of the leaf	colour with iodine solution
green	
white	

[2]

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(d) (i) The boxes on the left show the names of some substances that are made in plants.

The boxes on the right show uses of these substances in plants.

Draw lines to link each substance with its correct use in plants. Draw **three** lines.

substance	**use in plants**
	to attract insects for pollination
cellulose	
	to build cell walls
nectar	
	for transpiration
sucrose	
	for transport in the phloem

[3]

(ii) List the chemical elements contained in carbohydrates.

..... [1]

[Total: 10]

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3 **(a)** Fig. 3.1 is a diagram of a cross-section of a human heart.

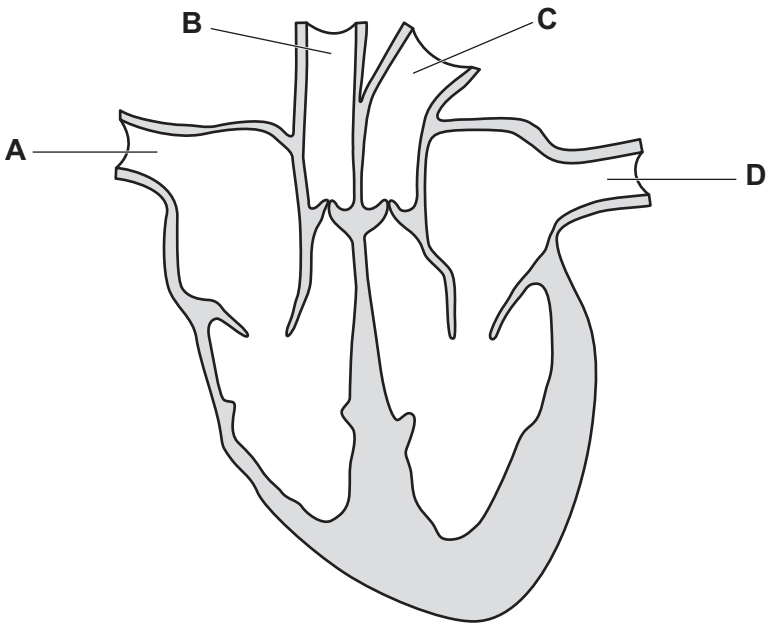

Fig. 3.1

(i) Draw an **X** on Fig. 3.1 to identify the position of the left atrium. [1]

(ii) On Fig. 3.1, label with a label line and the correct name a structure that ensures the one-way flow of blood. [2]

(iii) State **two** letters that identify arteries in Fig. 3.1.

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

(iv) State the name of the part that separates the left and right sides of the heart.

..... [1]

(v) State the name of the main tissue the wall of the heart is made from.

..... [1]

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(b) In one country, the percentages of males and females with coronary heart disease (CHD) in different age groups were recorded.

Fig. 3.2 shows these data.

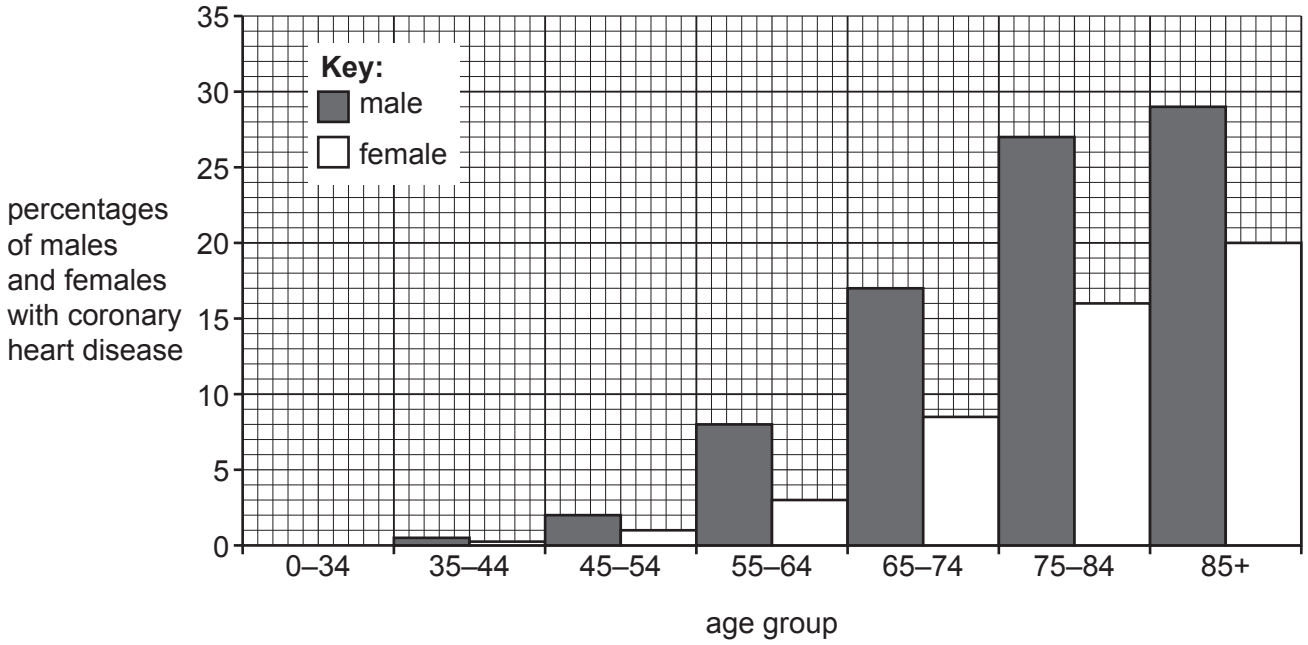

Fig. 3.2

(i) Using the information in Fig. 3.2, describe the similarities and differences between the percentages of males and females with CHD.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) State **three** risk factors for CHD **not** identified in Fig. 3.2.

1 .....

2 .....

3 .....

[3]

[Total: 12]

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4 **(a)** Fig. 4.1 shows a marine food web.

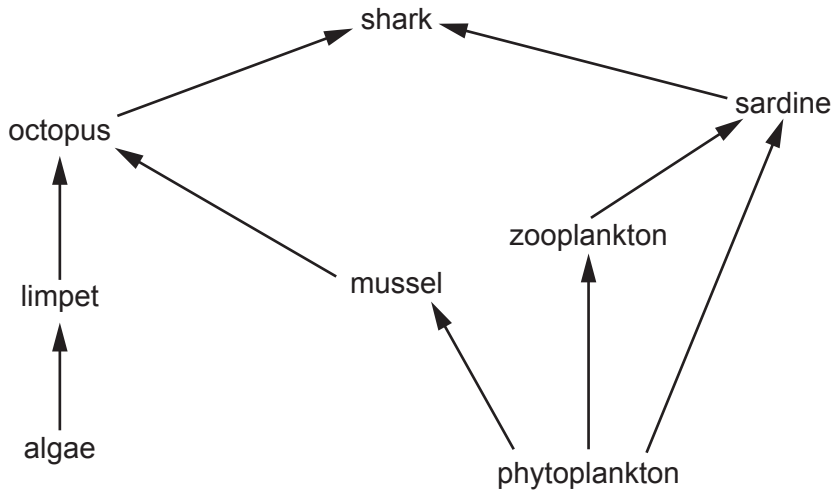

Fig. 4.1

(i) Place ticks (✓) in the boxes to show the correct descriptions for the organisms shown in Fig. 4.1.

organism	carnivore	herbivore	producer	tertiary consumer
algae				
zooplankton				
shark				

[3]

(ii) Construct **one** food chain from Fig. 4.1 that contains **four** organisms including the **octopus**.

..... [2]

(iii) Identify **one** organism in Fig. 4.1 that feeds at the second **and** third trophic levels.

..... [1]

(b) State the name of the type of organism that gets its energy from dead organic material.

..... [1]

(c) State the principal source of energy in most biological systems.

..... [1]

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(d) Outline ways humans can directly impact food webs.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

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5 **(a)** Antibiotics are a type of drug.

The box on the left contains the beginning of a sentence.

The boxes on the right show some sentence endings.

Draw lines to link the phrase ‘Antibiotic drugs’ on the left to **three** boxes on the right to make **three** correct sentences.

	affect chemical reactions in the body.
	are less effective against organisms that show resistance.
	are used to cure coronary heart disease.
Antibiotic drugs	
	are the main cause of rickets.
	kill bacteria.
	kill viruses.

[3]

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(b) Fig. 5.1 shows the number of antibiotic doses given per 1000 people per day in six different countries.

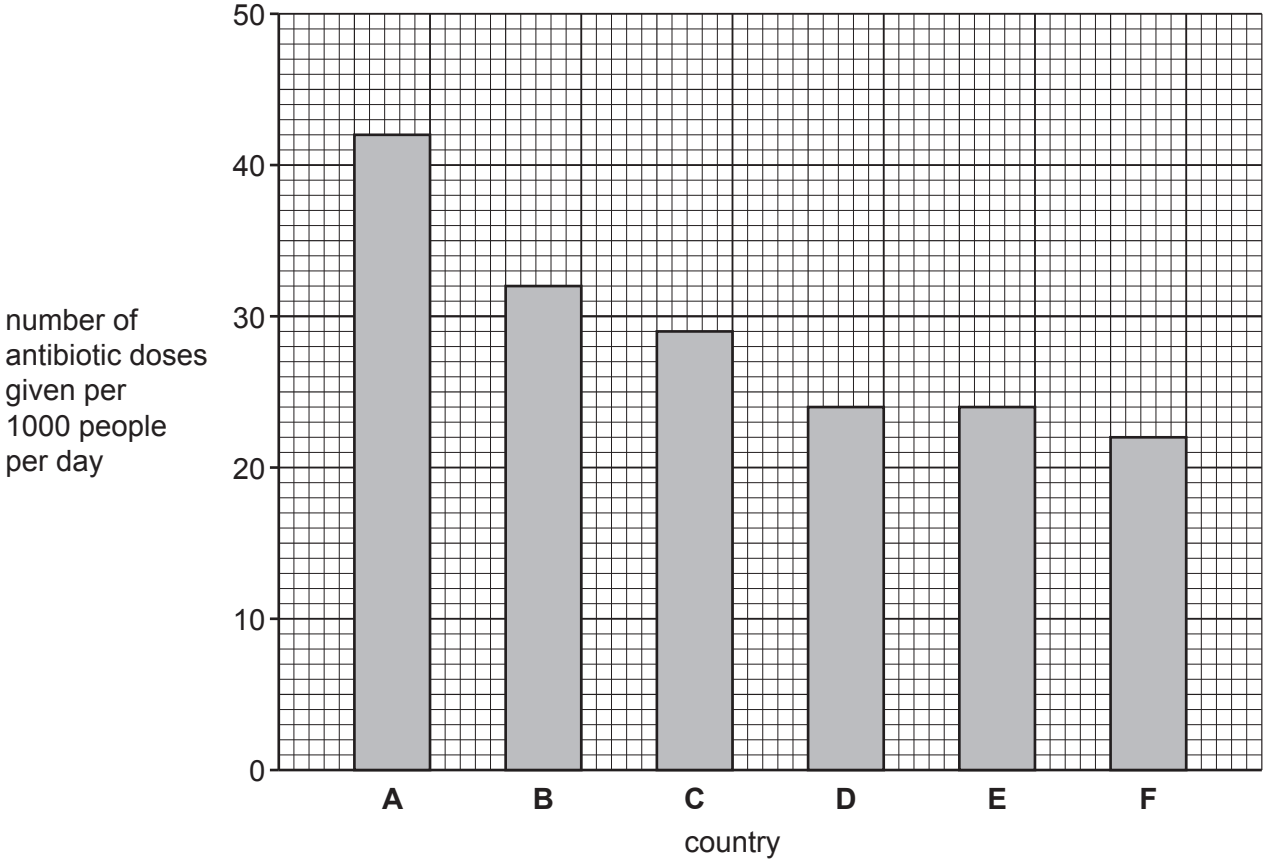

Fig. 5.1

(i) Calculate the difference in the number of antibiotic doses given per 1000 people per day between country **A** and country **F** in Fig. 5.1.

number of antibiotic doses given per 1000 people per day in country **A**

..... doses

number of antibiotic doses given per 1000 people per day in country **F**

..... doses

difference ..... doses
[2]

(ii) Using the information in Fig. 5.1, state the **two** countries that gave the same number of antibiotic doses per 1000 people per day.

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

[Total: 6]

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6 **(a)** Fig. 6.1 is a diagram showing the pathway of water into a plant. The arrows show the direction of water movement.

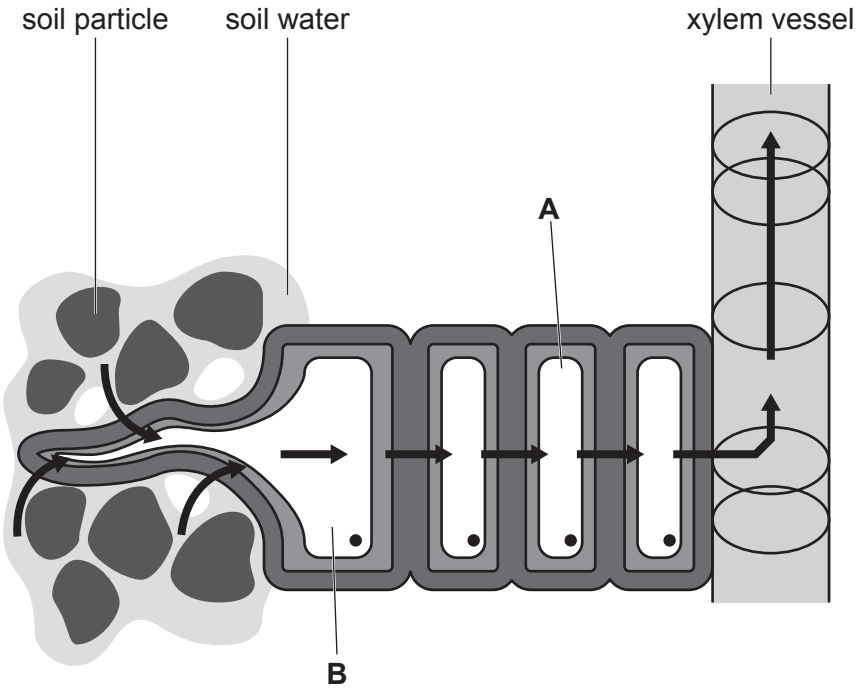

Fig. 6.1

(i) State the name of the cell labelled **A** in Fig. 6.1.

..... [1]

(ii) State the name of cell **B** and describe how it is adapted for absorption of water.

name .....

adaptation .....

.....

.....
[2]

(iii) State the name of the process by which cell **B** absorbs water.

..... [1]

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(b) State **two** uses of water in plants.

1 .....

2 .....
[2]

(c) State **two** environmental factors that will affect the rate of water loss from a plant.

1 .....

2 .....
[2]

[Total: 8]

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7 **(a)** Fig. 7.1 is a diagram of the female reproductive system in humans.

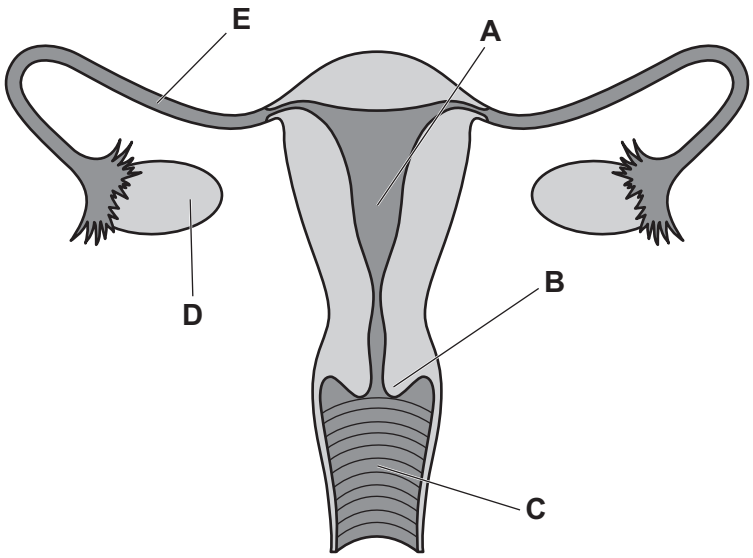

Fig. 7.1

Table 7.1 shows the name, letter and function of some of the parts in Fig. 7.1.

Complete Table 7.1.

Table 7.1

name of the part	letter in Fig. 7.1	function
uterus		where the fetus grows
		where fertilisation occurs
	D	

[5]

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(b) This list shows some specialised animal and plant cells.

ciliated cell	**guard cell**
neurone	**palisade mesophyll cell**
red blood cell	**white blood cell**

Choose words from the list to state the names of:

- two specialised plant cells

  ..... and .....

- the cell that transports oxygen

  .....

- the cell found in the trachea that moves mucus.

  .....

[4]

(c) State how new cells are produced.

.....

..... [1]

(d) Fig. 7.2 is a drawing of another specialised cell.

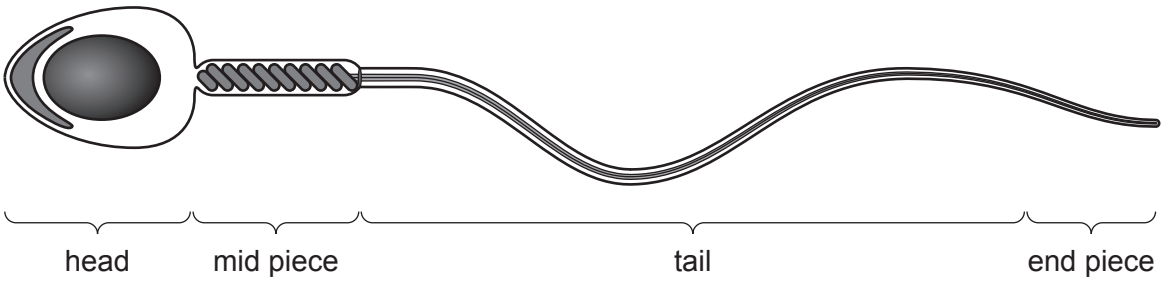

Fig. 7.2

(i) Label **three** cell structures in Fig. 7.2 with label lines and the correct names. [3]

(ii) State the name of the cell shown in Fig. 7.2.

..... [1]

[Total: 14]

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8 **(a)** All living organisms can be classified into groups by the features they share.

(i) Complete the sentences about classifying organisms.

A species is a group of organisms that reproduce to produce

..... offspring.

All species are named using an internationally agreed system called the

..... system.

Fish, mammals, reptiles and amphibians are vertebrate groups. The other

vertebrate group is ..... . All vertebrates belong to the

..... kingdom.

One feature that is used to identify vertebrates is a ..... .

[5]

(ii) Draw a (circle) around the characteristic shared by all living organisms.

egestion **nutrition** **sexual reproduction** **transpiration**

[1]

(b) Scientists measured the length of a sample of one species of fish.

Fig. 8.1 shows where the scientists took their measurements to determine the length of each fish.

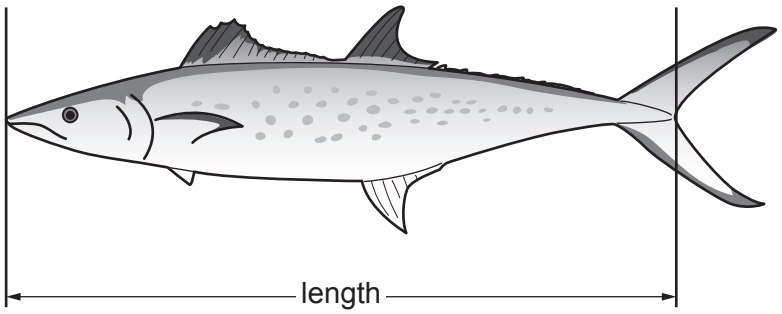

Fig. 8.1

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Table 8.1 shows the results.

Table 8.1

length / cm	number of fish
0–19	8
20–39	162
40–59	1710
60–79	1350
80–99	130
100–119	5

(i) Use the information in Table 8.1 to calculate the total number of fish the scientists measured.

..... [1]

(ii) State the most frequent length shown in Table 8.1.

..... cm [1]

(iii) State the type of variation shown by the data in Table 8.1.

..... [1]

(c) Place a tick (✓) in the box that shows the meaning of variation.

Variation is an alternative form of a gene.	
Variation is the differences between individuals of the same species.	
Variation is the recessive allele in a genotype.	
Variation is the transmission of genetic information from generation to generation.	

[1]

[Total: 10]

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