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BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2026**

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. Do **not** use correction fluid or tape.
- 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)** **(i)** Pectinase is an enzyme.

View solution

Circle the type of molecule that an enzyme is made from.

carbohydrate **fat** **protein**

[1]

(ii) Pectinase breaks down the carbohydrate pectin. Pectin is found in the cell walls of many types of fruit.

View solution

State the name of **one** other carbohydrate found in plant cell walls.

..... [1]

(b) Figure 1.1 shows the activity of pectinase at different temperatures.

View solution

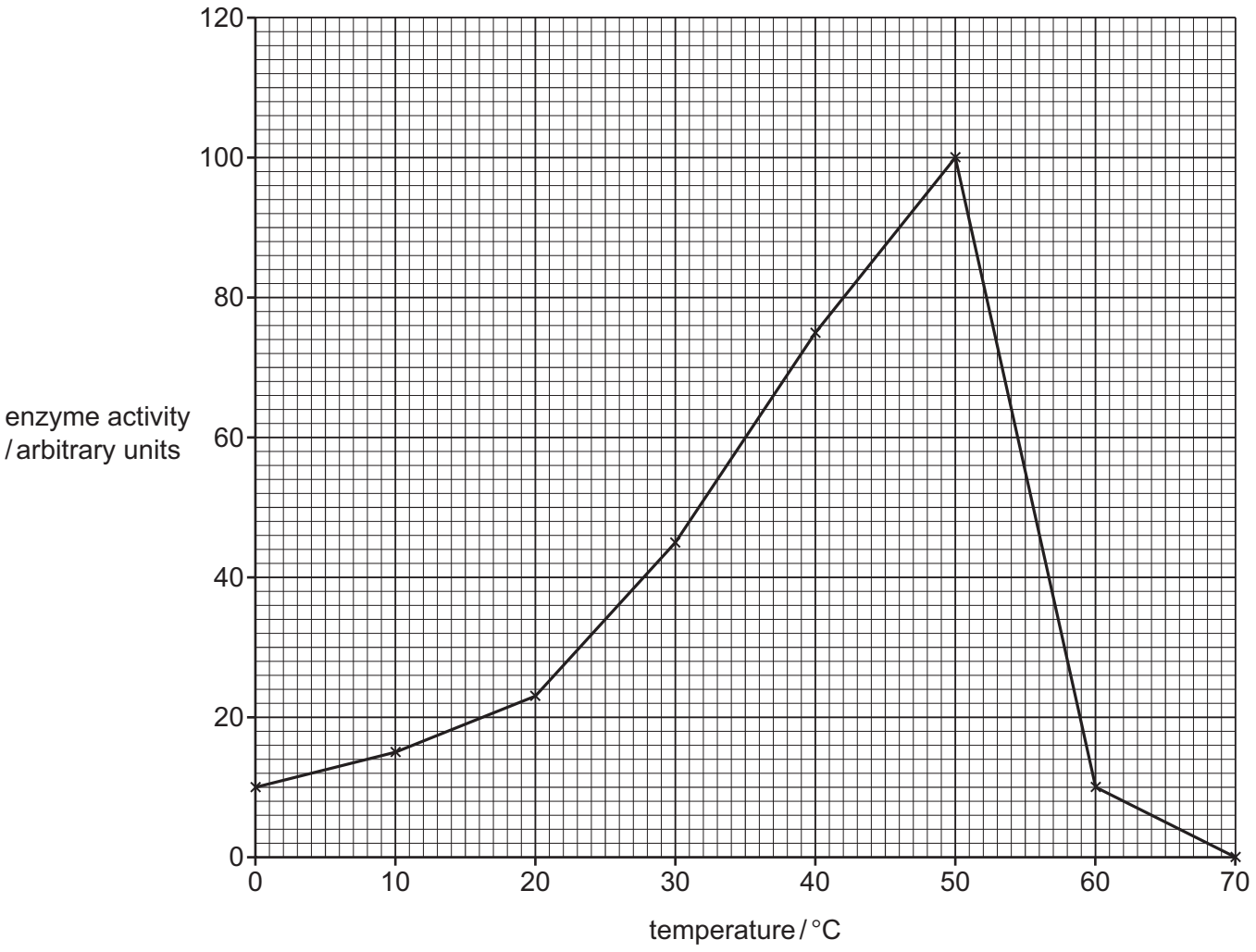

Figure 1.1

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Complete the sentences using the information in Figure 1.1.

Enzymes are ..... catalysts.

At 0 °C the enzyme activity is ..... arbitrary units.

The optimum temperature for enzyme activity is ..... °C.

At the optimum temperature, the shape of the ..... site of the pectinase enzyme is ..... to the shape of the substrate pectin.

At 70 °C, all of the enzymes have ..... .

[6]

View solution

(c) State **two** reasons why pectinase is used in the production of fruit juice.

1 .....

2 .....

[2]

View solution

(d) Pectinase enzymes are naturally produced by microorganisms, including bacteria.

State **two** reasons why bacteria are useful in biotechnology.

1 .....

2 .....

[2]

[Total: 12]

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2 **(a)** Scurvy and rickets are two diseases caused by a diet that is low in some nutrients.

View solution

(i) Draw **one** line from each disease to the nutrient that is low in the diet.

name of the disease	**nutrient that is low in the diet**
	calcium
rickets	iron
scurvy	protein
	vitamin C

[2]

(ii) A diet that is low in vitamin D is also a cause of rickets.

View solution

State **one** dietary source of vitamin D.

..... [1]

(iii) Vitamins, mineral ions and proteins are part of a balanced diet.

View solution

State **two** other components of a balanced diet.

1 .....

2 .....

[2]

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(b) The number of children with rickets was recorded in one area.

View solution

In 1990, the number of children with rickets was 3.

In 2010, the number of children with rickets was 30.

Calculate the percentage increase in the number of children with rickets between 1990 and 2010.

Space for working.

.....% [2]

(c) Rickets can affect teeth.

View solution

State the name of the white outer layer of a tooth.

..... [1]

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(d) Figure 2.1 is a drawing of different types of adult human teeth.

View solution

The teeth are drawn in the order that they are found in the lower jaw of the mouth.

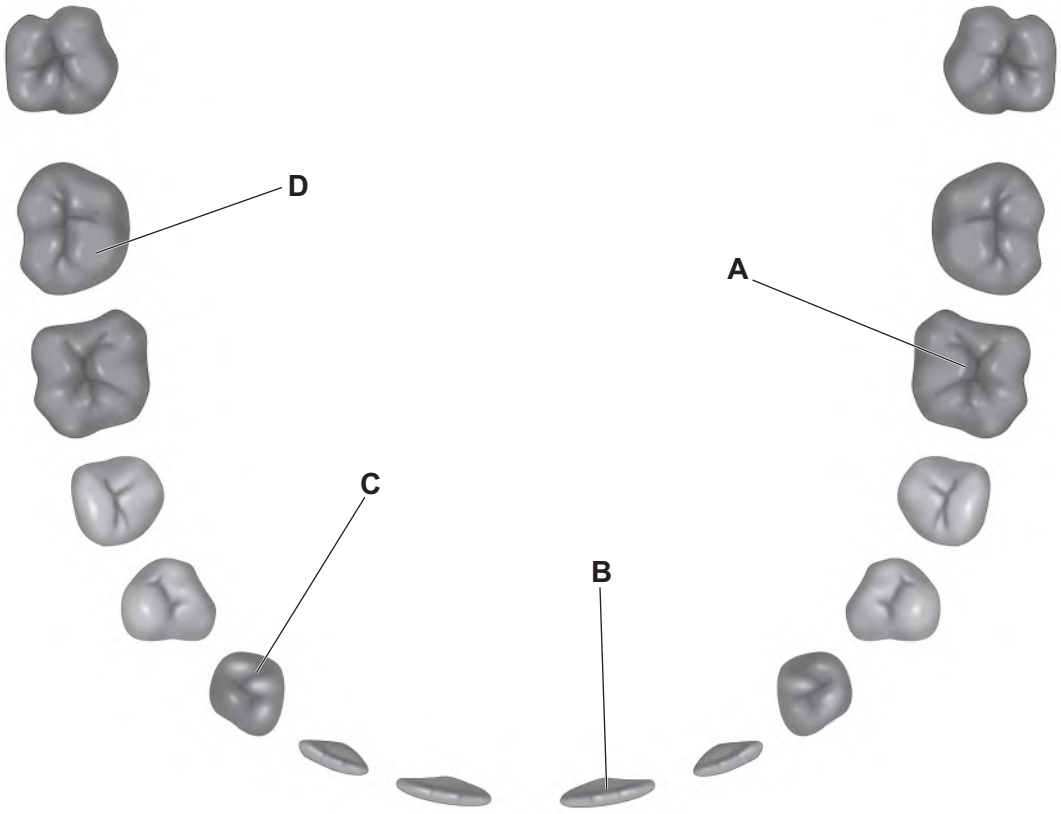

Figure 2.1

(i) Using the information in Figure 2.1, complete Table 2.1.

Table 2.1

letter in Figure 2.1	type of tooth	function of the tooth
B		
	molar	

[4]

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(ii) Figure 2.1 shows the teeth from the lower jaw of an adult.

View solution

The same number of teeth is found in the upper jaw of an adult.

Young children only have 20 teeth in total.

Calculate the difference between the number of teeth in an adult compared to the number of teeth in a young child.

..... [1]

(e) State the name of the type of digestion involving teeth.

View solution

..... [1]

[Total: 14]

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3 **(a)** In plants, substances are transported in the xylem and phloem.

View solution

State the names of **two** molecules transported by the phloem that are **not** transported by the xylem.

1 .....

2 .....

[2]

View solution

(b) Figure 3.1 is a photograph of a cross-section of a root.

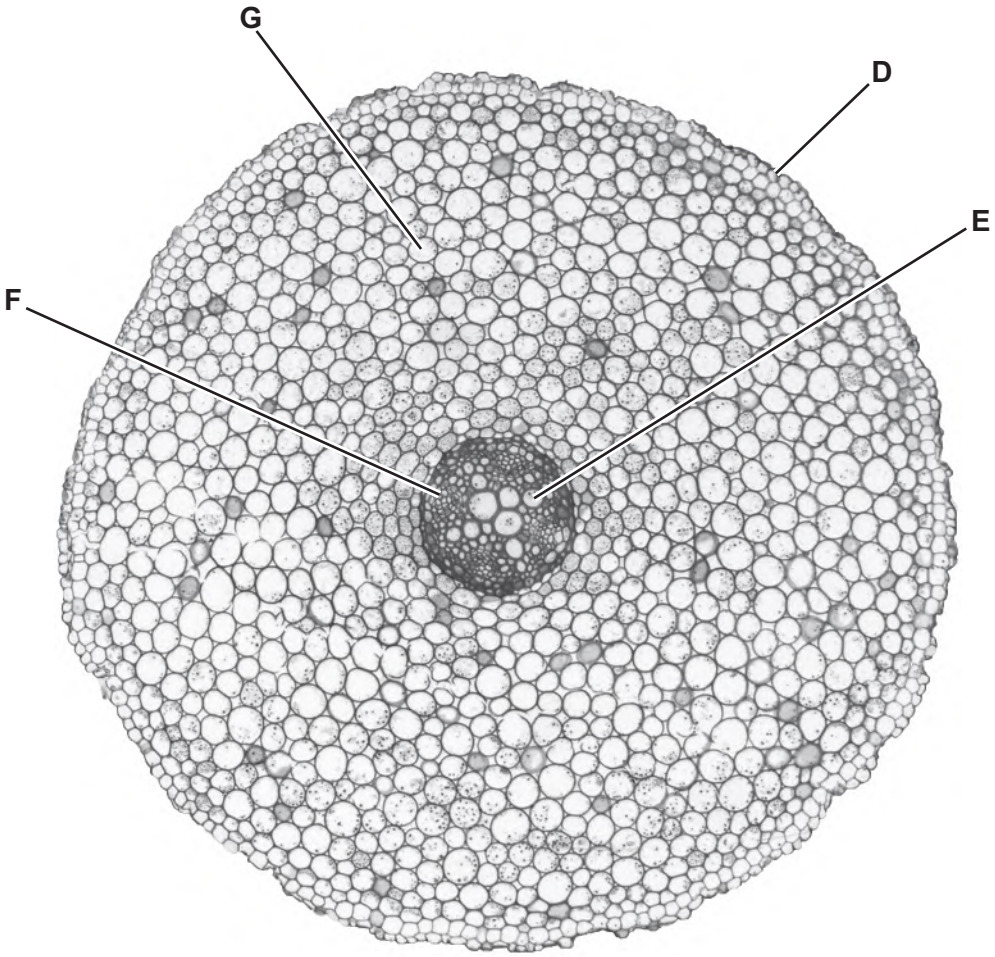

Figure 3.1

(i) State the letter in Figure 3.1 that shows the position of the phloem.

..... [1]

(ii) State the name of a cell structure found in a palisade mesophyll cell that is **not** found in the cells in Figure 3.1.

..... [1]

View solution

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(iii) The actual diameter of the root in Figure 3.1 is 2.40 mm.

View solution

Calculate the radius of the root.

r = ... mm

Calculate the circumference of the root using the formula $2\pi r$.

Use a value of 3.14 for π.

Give your answer to **two** decimal places.

Space for working.

..... mm
[3]

(c) Describe the pathway taken by water from the soil to the leaf of a plant.

View solution

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

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4 **(a)** **(i)** The box on the left shows the beginning of a sentence about the nervous system.

View solution

The boxes on the right show some sentence endings.

Draw **three** straight lines to make three correct sentences about the nervous system.

	carries chemical substances in the blood.
	coordinates a response to stimuli.
	has a slow response.
The nervous system	
	has long-term effects.
	regulates body functions.
	uses electrical impulses.

[3]

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

View solution

1 .....

2 .....

[2]

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(b) Table 4.1 shows structures that are involved in a reflex arc.

View solution

The structures are **not** in the correct order.

Table 4.1

A	effector
B	motor neurone
C	receptor
D	relay neurone
E	sensory neurone

Identify the order that an electrical impulse travels in a reflex arc.

Write the letters from Table 4.1 in the boxes provided to show the correct order.

[2]

(c) State the name of the junction between two neurones.

View solution

..... [1]

[Total: 8]

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5 **(a)** Figure 5.1 is a diagram of the female reproductive system.

View solution

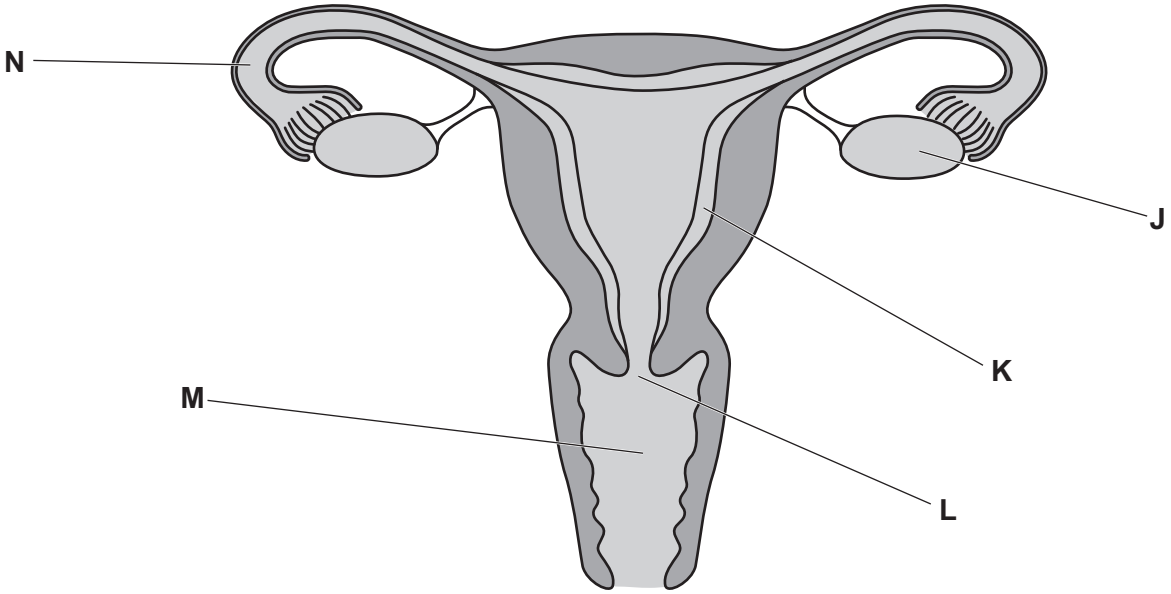

Figure 5.1

State the letters from Figure 5.1 that identify:

the place where sperm is deposited .....

the structure that secretes oestrogen .....

the place where fertilisation normally occurs .....

where an embryo normally implants. .....

[4]

(b) State the day in a 28-day menstrual cycle when an egg cell is most likely to be released.

View solution

..... [1]

(c) If an egg cell is fertilised, state the probability that the offspring will have XX chromosomes.

..... [1]

View solution

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(d) Describe the changes to the lining of the uterus during the menstrual cycle.

.....

.....

.....

.....

.....

.....

..... [3]

(e) Figure 5.2 is a diagram of an egg cell.

(i) Complete Figure 5.2 by labelling the structures in the egg cell on the answer lines provided.

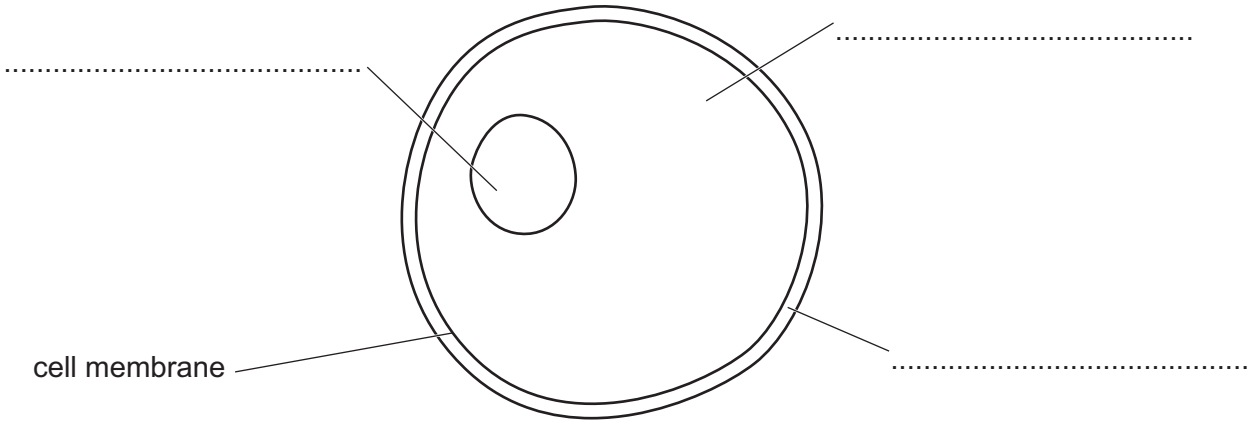

Figure 5.2

[3]

(ii) Explain why the egg cell contains a large energy store.

.....

.....

.....

.....

..... [2]

[Total: 14]

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6 **(a)** Describe what is meant by the term biodiversity.

.....

.....

.....

.....

..... [2]

View solution

(b) Figure 6.1 is a photograph of a great cormorant, *Phalacrocorax carbo*.



Figure 6.1

(i) State the genus of the great cormorant.

..... [1]

(ii) State **one** feature, visible in Figure 6.1, that is only found in birds.

..... [1]

View solution

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(c) Figure 6.2 is a food chain that includes the great cormorant.

phytoplankton ⟶ krill ⟶ herring ⟶ Atlantic salmon ⟶ great cormorant

Figure 6.2

View solution

(i) Some humans also eat herring.

Suggest **two** effects on the food chain shown in Figure 6.2 if humans harvest too many herring.

1 .....

.....

.....

2 .....

.....

.....

[2]

(ii) State the name of a producer in the food chain shown in Figure 6.2.

View solution

..... [1]

(iii) State the name of a secondary consumer in the food chain shown in Figure 6.2.

..... [1]

View solution

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(d) Scientists investigated the nests of five different species of bird on an island.

View solution

The percentage of nests containing plastic was calculated.

Figure 6.3 shows the results.

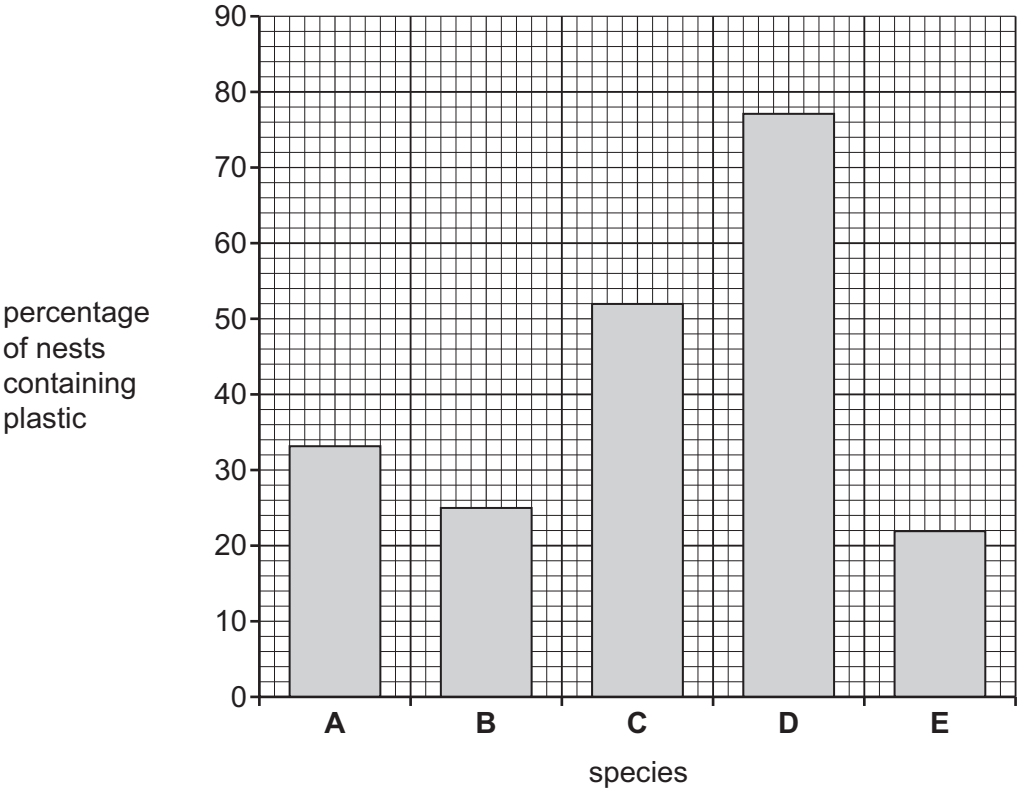

Figure 6.3

(i) The list shows five conclusions.

Tick (✓) **two** correct conclusions for the data shown in Figure 6.3.

The percentage of nests with plastic was above 25% for all species.	
The percentage of nests with plastic was higher for species **C** than for species **A**.	
The percentage of nests with plastic was highest for species **E**.	
The percentage of nests with plastic was lowest for species **B**.	
The percentage of nests with plastic was less than 80% for all species.	

[2]

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(ii) Suggest **two** disadvantages to birds of having nests containing non-biodegradable plastic.

View solution

1 .....

.....

2 .....

.....

[2]

(e) The population of great cormorants has decreased over time due to habitat destruction.

View solution

Describe reasons, **other than** plastic pollution, for habitat destruction.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 15]

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7 **(a)** Insulin is a hormone produced in humans.

View solution

State the effect of insulin in the human body.

.....

.....

..... [1]

View solution

(b) Bacteria can be genetically modified to produce human insulin.

Figure 7.1 shows a diagram of a bacterial cell.

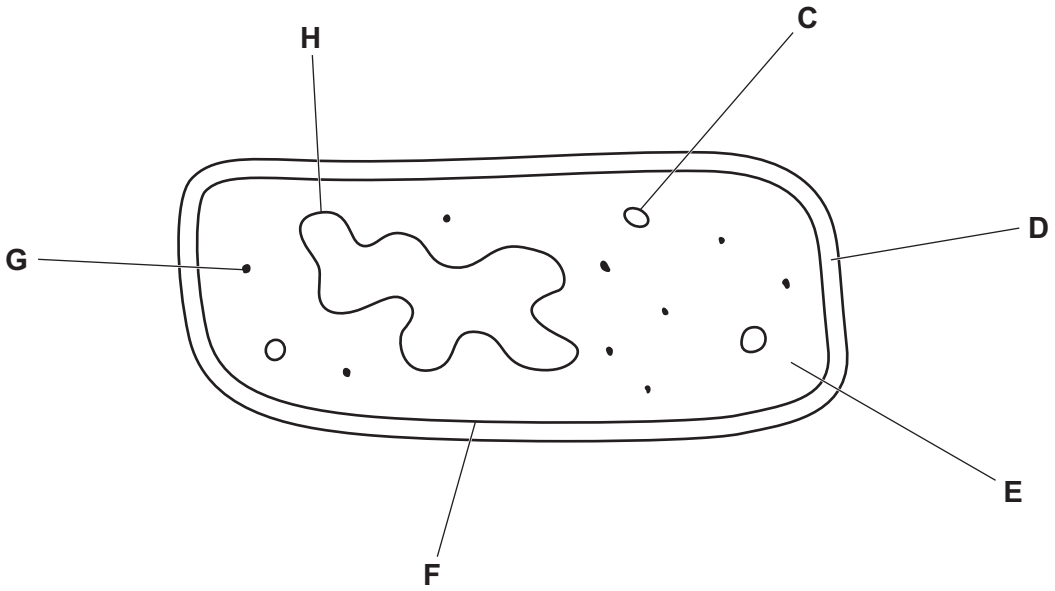

Figure 7.1

Complete Table 7.1 to identify the labelled structures, and the functions of the bacterial cell shown in Figure 7.1.

Table 7.1

letter in Figure 7.1	structure	function
C		small circle of DNA which can be exchanged with other bacteria
	cell membrane	
G		site of protein synthesis

[4]

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(c) Crops can be genetically modified to be resistant to herbicides and insecticides.

View solution

(i) State **one** reason why farmers use herbicides.

.....

.....

..... [1]

(ii) State **one** reason why farmers use insecticides.

View solution

.....

.....

..... [1]

[Total: 7]

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