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CANDIDATE NAME

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9369981934

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2025**

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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[Turn over

1 **(a)** Gonorrhoea is a sexually transmitted infection caused by a bacterium.

Fig. 1.1 is a diagram of the bacterium that causes gonorrhoea.

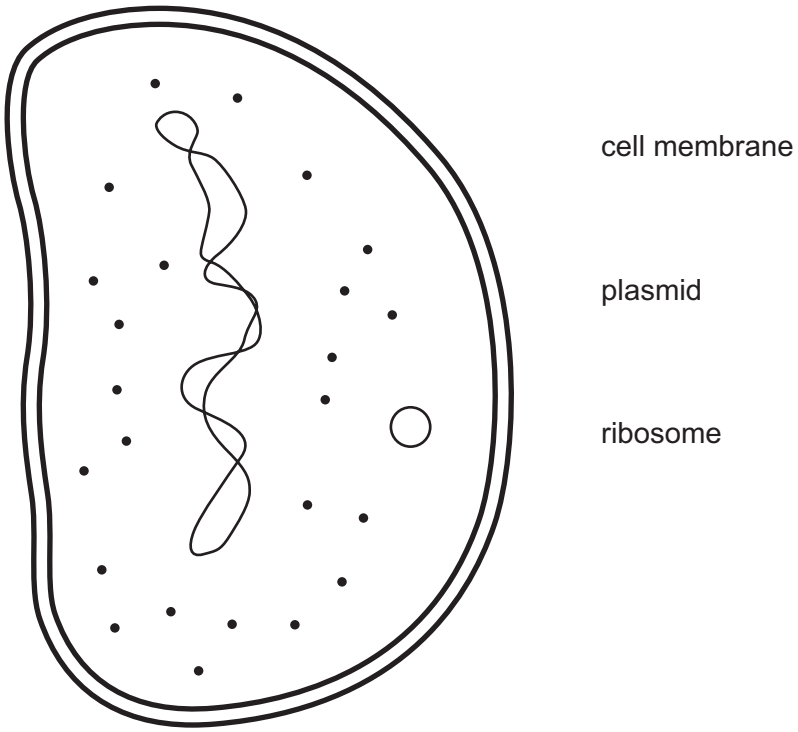

Fig. 1.1

(i) Draw label lines **on Fig. 1.1** to link each label to the correct structure. [3]

(ii) State **two** characteristics of living organisms shown by bacteria.

1 .....

2 .....

[2]

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(b) Fig. 1.2 shows the number of people infected with gonorrhoea, in one country, from the year 2010 to the year 2020.

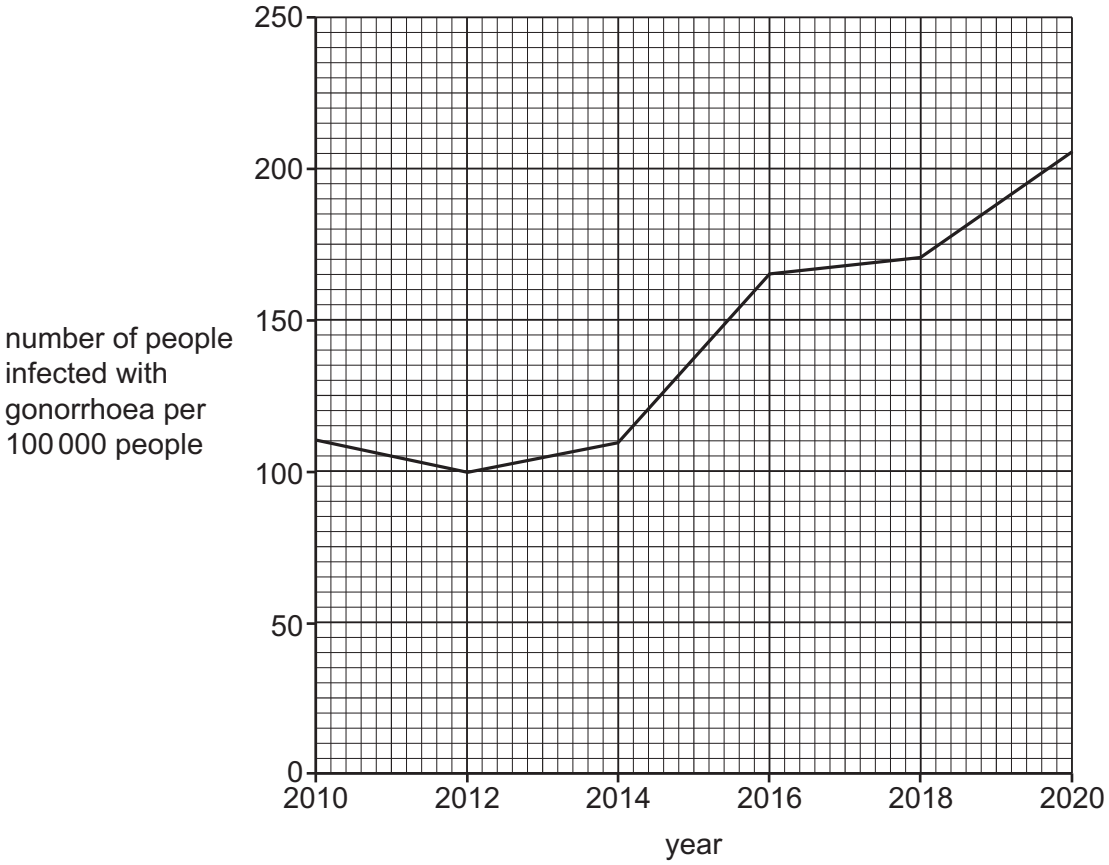

Fig. 1.2

(i) Complete the sentences to describe the data shown in Fig. 1.2.

Overall, the number of people infected ..... .

The two-year period with the largest change in the number of people infected is from

..... to ..... .

In 2020, the number of people infected with gonorrhoea was

..... per 100 000 people.

[3]

(ii) The population of the country was 800 000 people.

Calculate how many people were infected with gonorrhoea in 2012.

..... people [1]

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(c) Gonorrhoea infections have been treated with an antibiotic called azithromycin.

Each year this treatment has become less effective.

Suggest **one** reason why fewer bacteria are now being killed by the antibiotic.

.....

.....

..... [1]

(d) Describe methods of controlling the spread of sexually transmitted infections such as gonorrhoea.

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..... [4]

[Total: 14]

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2 Fig. 2.1 is a diagram of a cross-section of a root.

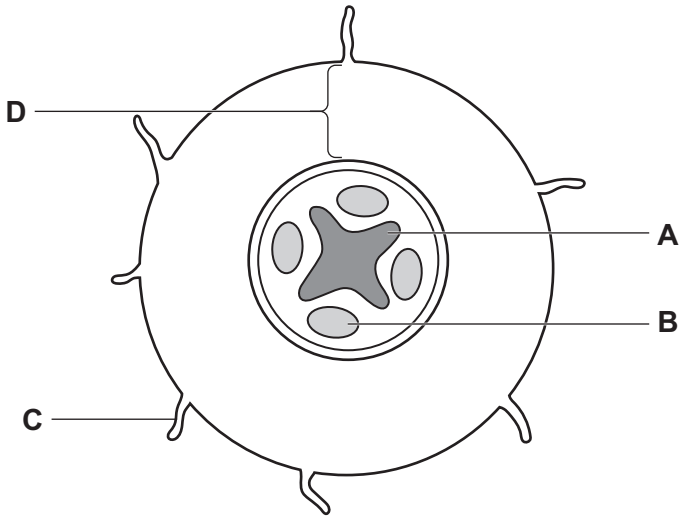

Fig. 2.1

(a) (i) State the letter in Fig. 2.1 that shows:

a tissue that transports amino acids .....

xylem tissue. .....

[2]

(ii) State the name of the cells in the part of the root labelled **D** in Fig. 2.1.

..... [1]

(b) State **two** functions of xylem.

1 .....

2 .....

[2]

(c) (i) State the name of the structure labelled **C** in Fig. 2.1.

..... [1]

(ii) State the process by which water enters structure **C** in Fig. 2.1.

..... [1]

(iii) State the feature of **C** in Fig. 2.1 that increases the uptake of water.

..... [1]

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(d) Table 2.1 shows some features of processes that can be used to move substances.

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

Table 2.1

process	feature		
	requires a cell membrane	substance moves down a concentration gradient	requires energy from respiration
active transport			
diffusion			

[3]

(e) State the name of the structures in a plant cell where aerobic respiration occurs.

..... [1]

[Total: 12]

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3 Fig. 3.1 is a diagram showing the locations of some endocrine glands in humans.

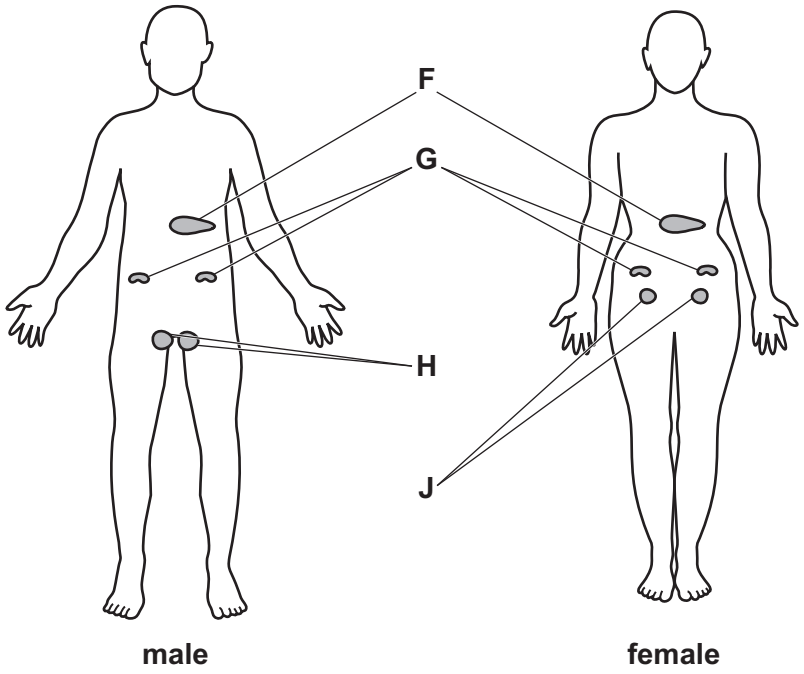

Fig. 3.1

(a) (i) Use the information in Fig. 3.1 to complete Table 3.1.

Table 3.1

gland	letter on Fig. 3.1	hormone secreted
	G	adrenaline
ovary		oestrogen
pancreas		
testes	**H**	

[4]

(ii) State the meaning of the term hormone.

.....

.....

.....

..... [3]

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(iii) The box on the left shows the beginning of a sentence.

The boxes on the right show some sentence endings.

Draw **two** lines from the box on the left to the boxes on the right to make two correct sentences.

	act more slowly than the nervous system acts.
	are impulses.
Hormones	have effects with a shorter duration than the effects of the nervous system.
	are involved in homeostasis.

[2]

(b) Adrenaline has many effects on the human body.

Complete the sentences about the effects of adrenaline.

Circle the correct word in each group of three words that are shown in bold.

Adrenaline is secreted to prepare the body for **action / relaxation / sleep**.

The heart rate increases to pump more blood containing **carbon dioxide / oxygen / nitrogen** to the muscles.

The breathing rate increases to excrete more **alcohol / carbon dioxide / urea** from the body.

The diameter of the pupils increases to let in **more / less / the same amount of** light.

[4]

[Total: 13]

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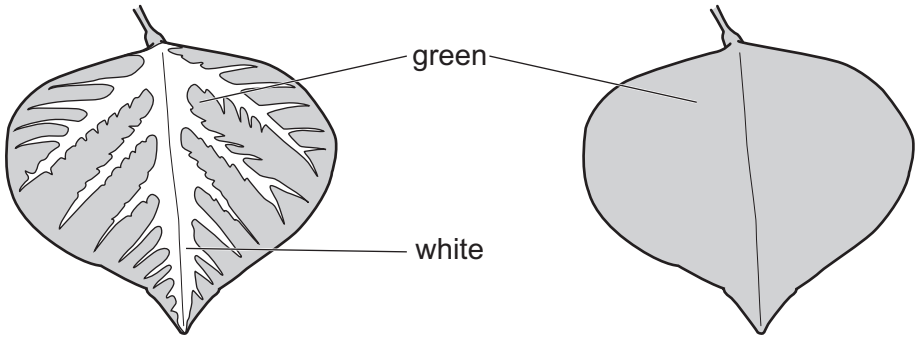
4 **(a)** State the word equation for photosynthesis.

..... [2]

(b) Fig. 4.1 is a diagram of leaves from two plants of the same species.

One plant has variegated leaves with green and white areas.

The other plant has leaves that are only green.



variegated (green and white) leaf green leaf

Fig. 4.1

(i) State the name of the structure in plant cells where photosynthesis occurs.

..... [1]

(ii) State the name of the pigment which is present in the green parts of the leaf but is **not** present in the white parts of the leaf.

..... [1]

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(c) A student investigated the effect of light intensity on photosynthesis.

Fig. 4.2 is a diagram of the apparatus used.

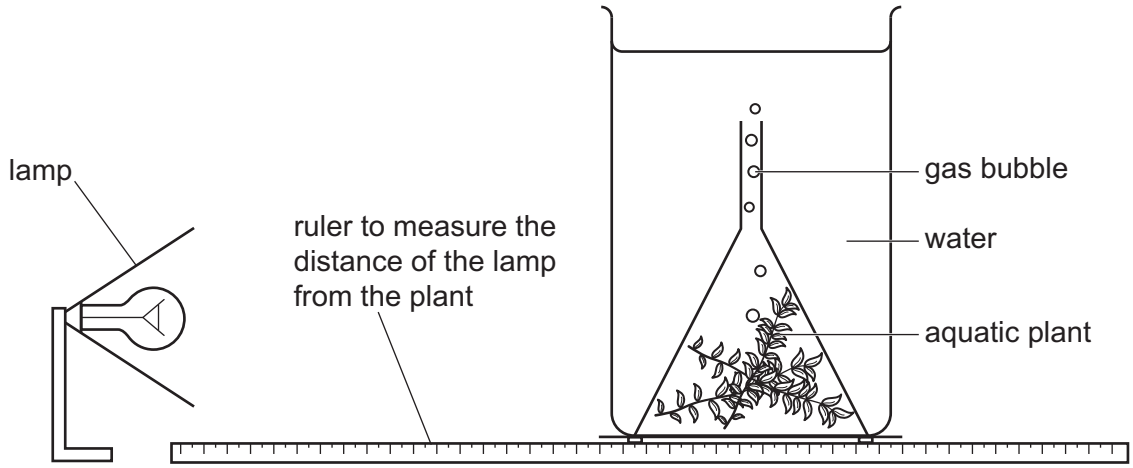

Fig. 4.2

The investigation was done in a room where the lamp was the only source of light.

A lamp was placed 5 cm from the aquatic plant.

The number of gas bubbles produced in one minute was recorded.

The distance of the lamp was changed and the investigation was repeated.

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The results are shown in Table 4.1.

Table 4.1

distance of the lamp from the aquatic plant / cm	number of gas bubbles produced in one minute
5	31
10	20
15	13
20	8
25	5
30	3

(i) Calculate the percentage decrease in the number of gas bubbles produced in one minute, when the distance of the lamp changed from 15 cm to 30 cm.

Give your answer as a whole number.

Space for working.

..... % [3]

(ii) Describe **and** explain the results shown in Table 4.1.

.....

.....

.....

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.....

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..... [4]

[Total: 11]

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5 Fig. 5.1 is a diagram of the female reproductive system in humans.

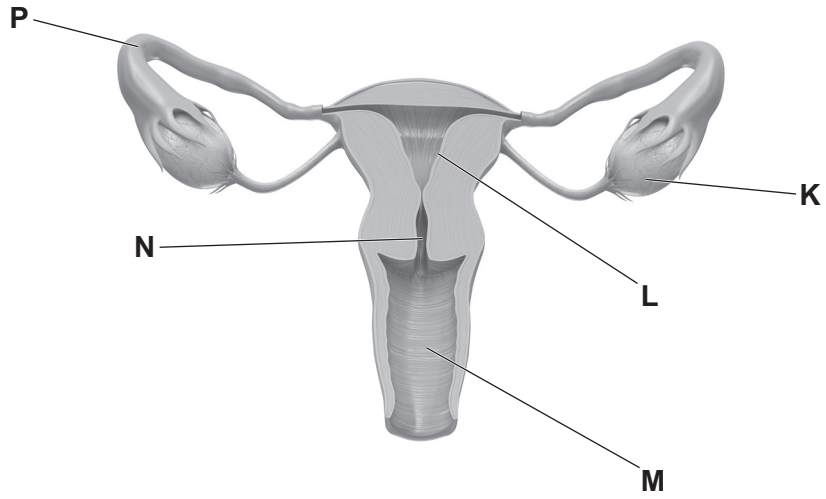

Fig. 5.1

(a) (i) State the letter in Fig. 5.1 that identifies:

the structure that releases egg cells .....

the structure where fertilisation usually occurs .....

the structure where an embryo implants. .....

[3]

(ii) State the names of structures **L**, **M** and **N** in Fig. 5.1.

L .....

M .....

N .....

[3]

(b) State **two** adaptive features of egg cells.

1 .....

2 .....

[2]

[Total: 8]

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6 **(a)** The list shows some statements about variation.

Place ticks (✓) in the boxes to show which statements are correct.

Variation is discontinuous if there are a limited number of phenotypes with no intermediates.	
Variation is the similarities between individuals of different species.	
Variation is only caused by genes.	
Variation may be produced by mutation.	

[2]

(b) Fava bean plants need a good water supply to produce beans.

A drought is a period of low rainfall.

Farmers want fava bean plants that can tolerate drought.

(i) Complete the steps a farmer should use to produce fava bean plants which can tolerate drought.

Step 1 Choose plants with the highest drought tolerance.

Step 2 .....

.....

Step 3 .....

.....

[2]

(ii) State the name of the process the fava bean farmer uses to produce drought tolerant plants.

..... [1]

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(c) Fig. 6.1 is a photograph of part of a fava bean plant, *Vicia faba*.

Fig. 6.1

(i) State the genus of the plant shown in Fig. 6.1.

..... [1]

(ii) The flower petals of this fava bean plant have coloured spots.

The allele for black spots is dominant and is represented by the letter **B**.

The allele for yellow spots is recessive and is represented by the letter **b**.

A plant with flowers with black spots was crossed with a plant with flowers with yellow spots.

The Punnett square shows the alleles in the gametes of the plant with flowers with black spots.

Complete the Punnett square and calculate the phenotypic ratio of the offspring plants.

		flowers with black spots	
		B	**b**
flowers with yellow spots	.....	.....	.....
	.....	.....	.....

phenotypic ratio of the offspring plants

..... flowers with black spots : ..... flowers with yellow spots [3]

[Total: 9]

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7 **(a)** Fig. 7.1 shows a food chain for some organisms living in a large lake.

giant water lily → water lily beetle → frog → heron

Fig. 7.1

Table 7.1 shows some information about the organisms in the food chain in Fig. 7.1.

Table 7.1

organism	mass of one organism / g	number of organisms
giant water lily	400 000	1
water lily beetle	2	20 000
frog	500	10
heron	1 200	1

Fig. 7.2 shows pyramids based on the information in Fig. 7.1 and Table 7.1.

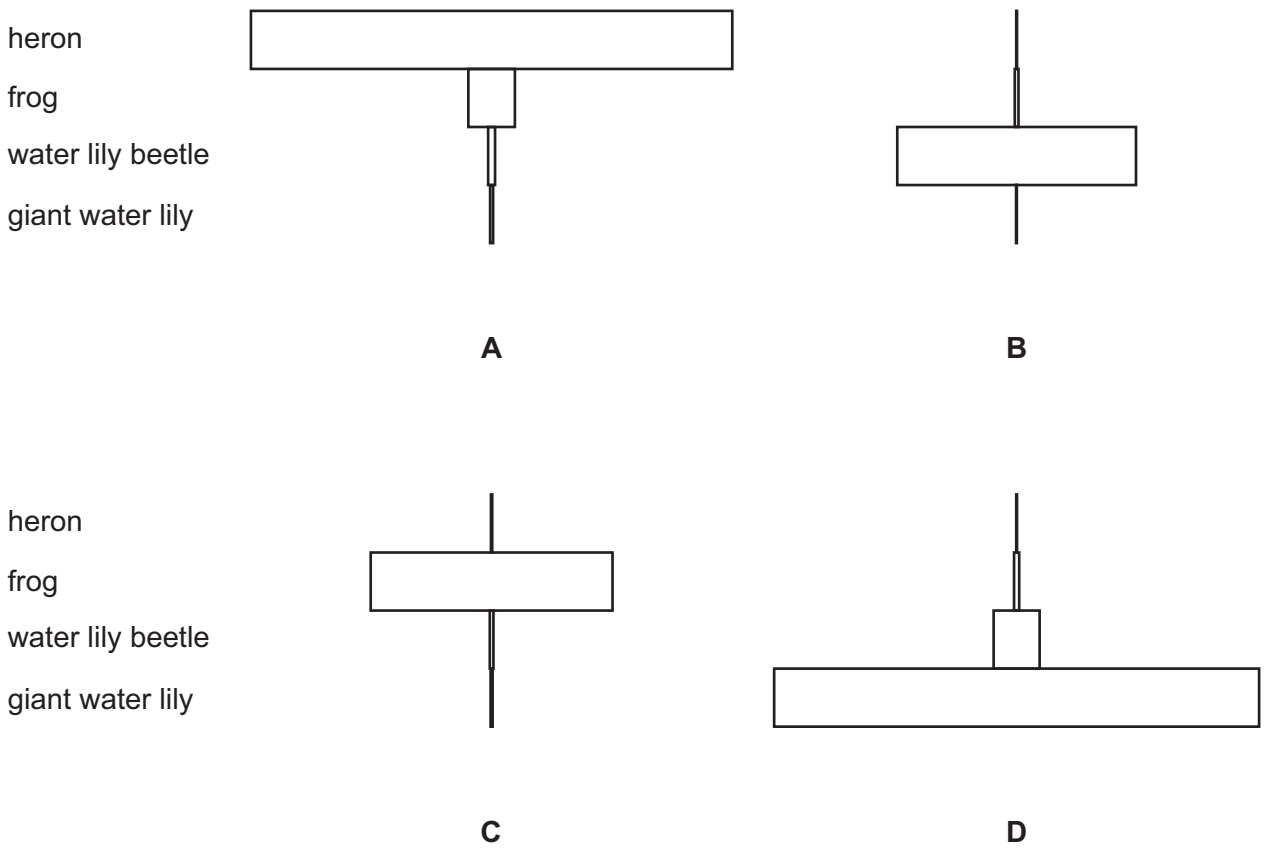

Fig. 7.2

For the food chain in Fig. 7.1, state the letter in Fig. 7. 2 which shows:

a pyramid of numbers .....

a pyramid of biomass. .....

[2]

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(b) Fig. 7.3 is a food web for a different large lake.

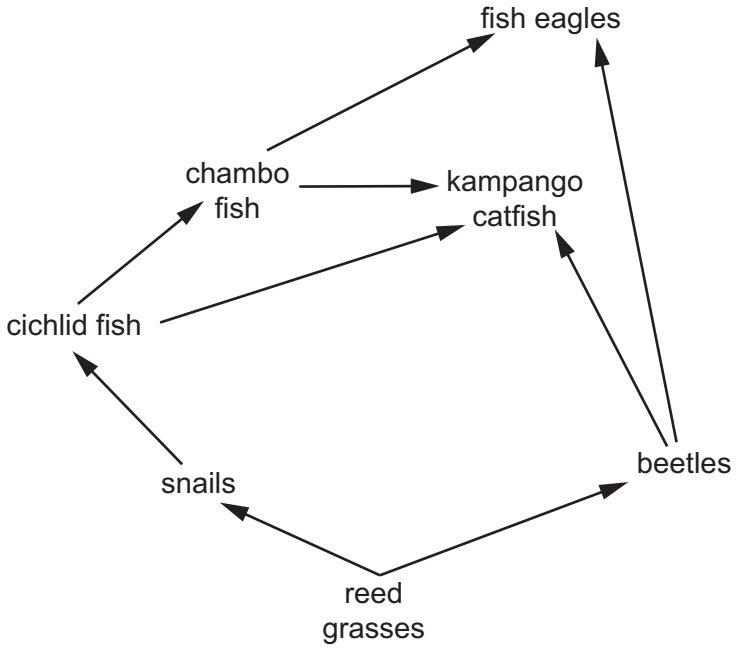

Fig. 7.3

(i) State **one** organism, shown in Fig. 7.3, that receives energy from the chambo fish.

..... [1]

(ii) State the number of trophic levels in the food web shown in Fig. 7.3.

..... [1]

(iii) Using the food web shown in Fig. 7.3, state the name of an organism:

feeding at the second trophic level .....

feeding at more than one trophic level. .....

[2]

(c) The population of chambo fish has decreased over the past twenty years.

Suggest **two** reasons for the decrease in the population of chambo fish.

1 .....

.....

2 .....

.....

[2]

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(d) Describe how endangered species can be conserved.

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.....

.....

.....

.....

..... [3]

(e) Fish can be managed as a sustainable resource.

Describe what is meant by the term sustainable resource.

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..... [2]

[Total: 13]

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