



**MALVERN**  
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**SURNAME:**

**FIRST NAME:**

**PREP SCHOOL:**

**Malvern College Academic Scholarship Examinations 2024**

# **BIOLOGY**

**Please read this information before the examination starts:**

- It is recommended you spend 20-minutes on this section.
- Answer all questions

## Questions

Q1.

Many cells contain an enzyme called catalase.

Catalase breaks down hydrogen peroxide into water and oxygen.

A scientist investigated the effect of hydrogen peroxide concentration on the time taken to produce 20 cm<sup>3</sup> of oxygen.

Figure 12 shows the equipment used.

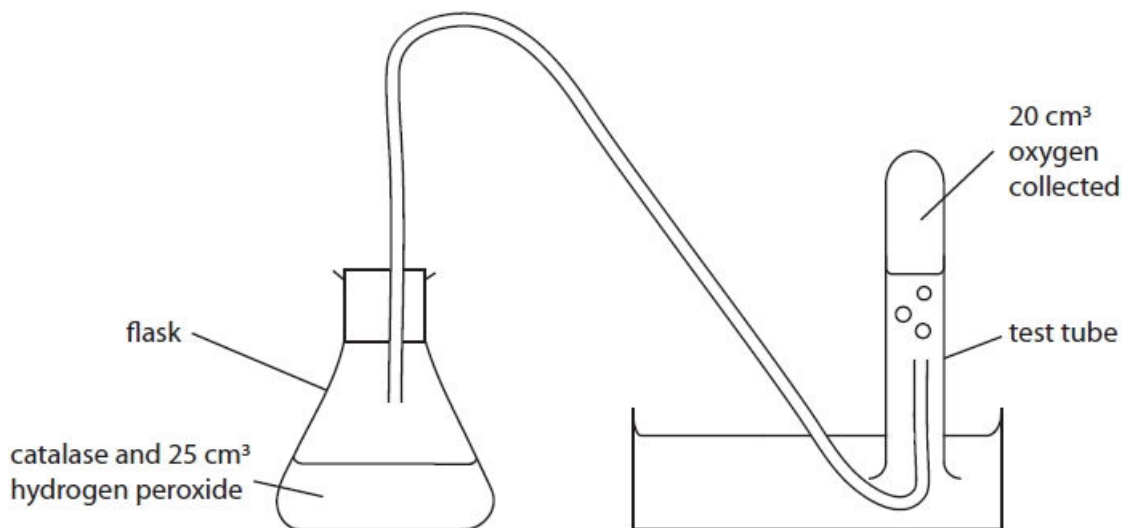


Figure 12

(i) State how the scientist could control the temperature of the flask.

[1]

.....  
.....

(ii) Explain why the temperature should be controlled in this investigation.

[3]

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(iii) This investigation used five different concentrations of hydrogen peroxide.

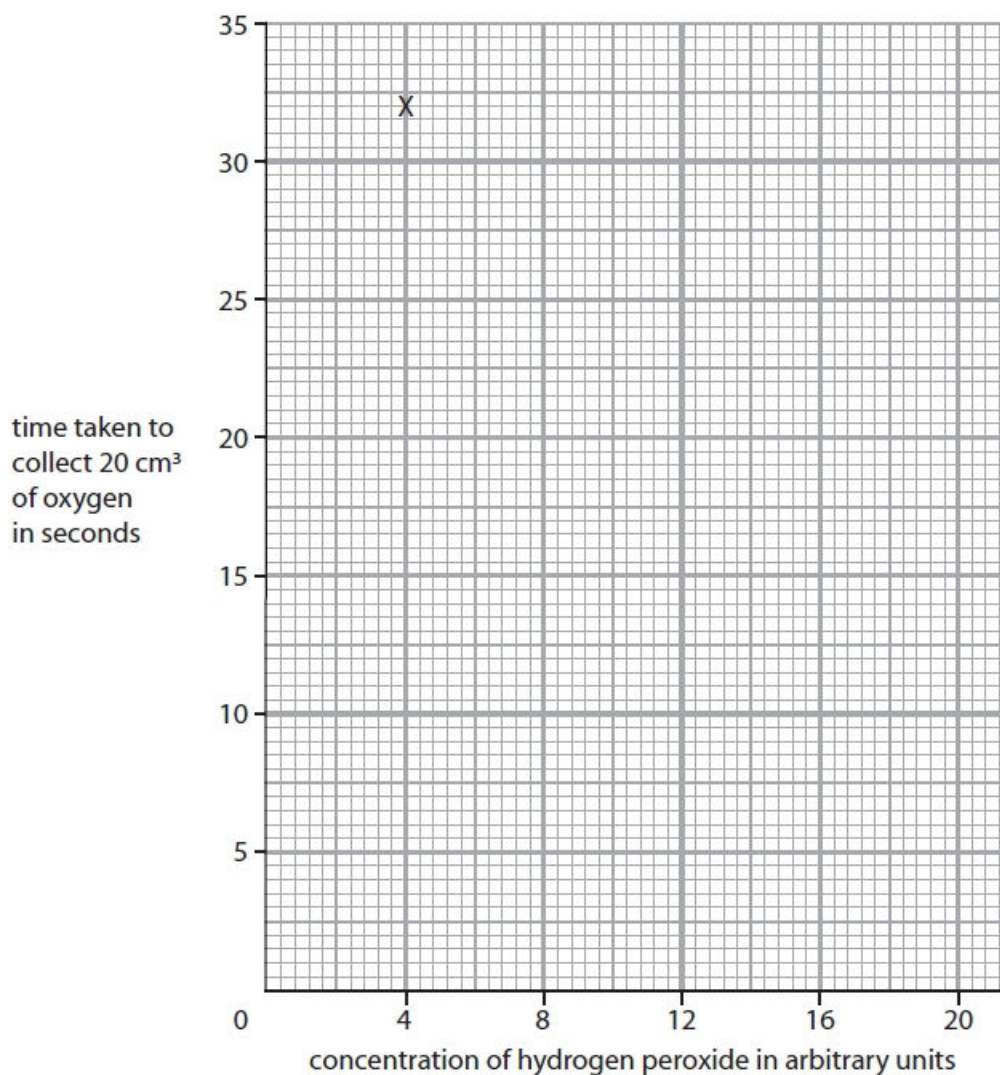
Figure 13 shows the results of this investigation.

concentration of hydrogen peroxide in arbitrary units	time taken to collect 20 cm <sup>3</sup> of oxygen in seconds
4	32
8	14
12	9
16	7
20	6

**Figure 13**

Complete the graph by plotting the points and drawing a line to show the trend in the data. The first point has been plotted for you.

[2]



(iv) Describe the trend shown in the graph.

Use data from the table in Figure 13 to support your answer.

[3]

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.....

(Total for question = 9 marks)

**Q2.**

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .

Birds are classified in the domain Eukarya.

(i) Why are the cells from birds described as eukaryotic?

[1]

- A** they have membrane-bound organelles
- B** they do not have nuclei
- C** they have a rigid cell wall
- D** they have a cell membrane

(ii) Give **one** reason why the three domain classification system was proposed.

[1]

.....

.....

.....

(Total for question = 2 marks)

**Q3.**

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ~~☒~~ and then mark your new answer with a cross ☒.

Body mass index (BMI) is calculated using the equation:

$$\text{BMI} = \frac{\text{mass (kg)}}{(\text{height (m)})^2}$$

(i) Person A is 1.8 m tall and has a mass of 64.8 kg.

Calculate the BMI of person A.

[2]

BMI = .....

(ii) Figure 9 shows some information about BMI.

BMI	BMI category
less than 18.5	underweight
18.5 to 24.9	healthy weight
25 to 29.9	overweight
more than 29.9	obese

**Figure 9**

Person B has a BMI of 18.5.

Which category is correct for person B?

[1]

- A** underweight
- B** healthy weight
- C** overweight
- D** obese

(iii) Person C has a BMI of 28.5.

Explain **one** way person C could change their lifestyle to reach a healthy weight.

[2]

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.....

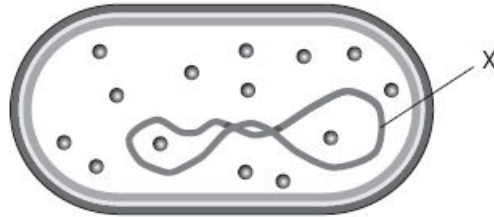
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**(Total for question = 5 marks)**

**Q4.**

The human immune system helps defend the body against disease.

Figure 1 shows a bacterial cell that can cause disease.



**Figure 1**

What is the part of the cell labelled X?

[1]

- A** cytoplasm
- B** nucleus
- C** chromosome
- D** plasmid

**(Total for question = 1 mark)**

Questions continue over the page

Q5.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ~~☒~~ and then mark your new answer with a cross ☒.

Figure 4 shows three cells.

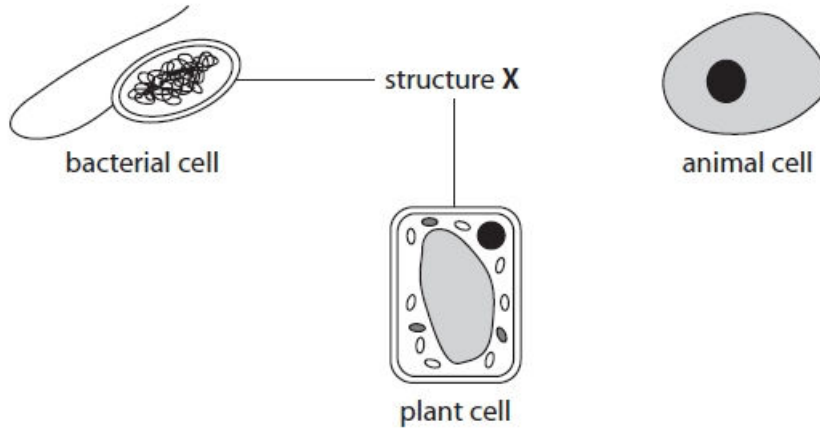


Figure 4

(i) What is structure X?

- A cell membrane
- B cell wall
- C cytoplasm
- D nucleus

[1]

(ii) The bacterial cell in Figure 4 has a flagellum.

State the function of a flagellum.

[1]

.....

.....

(iii) Give **one** other difference between the bacterial cell and the animal cell shown in Figure 4.

[1]

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.....

(Total for question = 3 marks)



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