

GCSE

BIOLOGY

Biology Test 2: Infection and response and Bioenergetics (Higher)

Total number of marks: 32

0	6
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A virus called RSV causes severe respiratory disease.

0	6	.	1
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Suggest **two** precautions that a person with RSV could take to reduce the spread of the virus to other people.

[2 marks]

1 _____

2 _____

0	6	.	2
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One treatment for RSV uses monoclonal antibodies which can be injected into the patient.

Scientists can produce monoclonal antibodies using mice.

The first step is to inject the virus into a mouse.

Describe the remaining steps in the procedure to produce monoclonal antibodies.

[3 marks]

0	6	.	3
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Describe how injecting a monoclonal antibody for RSV helps to treat a patient suffering with the disease.

[2 marks]

A trial was carried out to assess the effectiveness of using monoclonal antibodies to treat patients with RSV.

Some patients were given a placebo.

0	6	.	4
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Why were some patients given a placebo?

[1 mark]

A number of patients had to be admitted to hospital as they became so ill with RSV.

The results are shown in **Table 3**.

Table 3

Treatment received by patient	% of patients within each group admitted to hospital with RSV
Group A: Monoclonal antibody for RSV	4.8
Group B: Placebo	10.4

The trial involved 1 500 patients.

- Half of the patients (group A) were given the monoclonal antibodies.
- Half of the patients (group B) were given the placebo.

0 6 . 5

Calculate the total number of patients admitted to hospital with RSV during the trial.

[2 marks]

Total number of patients admitted to hospital = _____

0 6 . 6

Evaluate how well the data in **Table 3** supports the conclusion:

'monoclonal antibodies are more effective at treating RSV than a placebo'.

[2 marks]

0 3 This question is about photosynthesis.

0 3 . 1 Complete the word equation for photosynthesis:

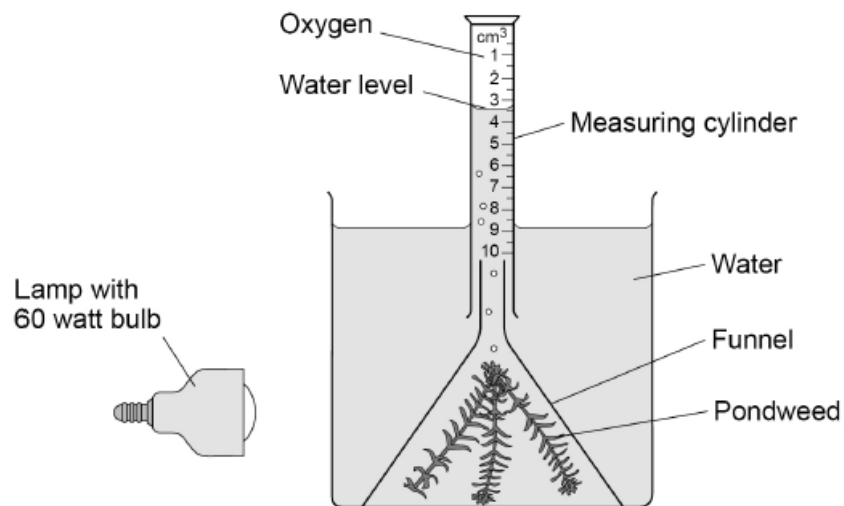
[2 marks]

_____ + _____ → _____ + oxygen

A student investigated photosynthesis using pondweed.

Figure 3 shows the apparatus the student used.

Figure 3



This is the method used.

1. Set up the apparatus as shown in **Figure 3**.
2. Switch on the lamp.
3. After 20 minutes, record the volume of oxygen collected in the measuring cylinder.
4. Repeat steps 1–3 using bulbs of different power output.

0 3 . 2 What was the independent variable in the investigation?

[1 mark]

Tick (✓) **one** box.

Power output of bulb

Rate of photosynthesis

Time to collect oxygen

Volume of oxygen collected

0 3 . 3 Suggest **two** ways the method could be improved so the results would be more valid.

[2 marks]

1 _____

2 _____

Table 3 shows the student's results.

Table 3

Power output of bulb in watts	Volume of oxygen collected in 20 minutes in cm ³	Rate of photosynthesis in cm ³ /hour
60	0.5	1.5
100	0.8	2.4
150	1.1	X
200	1.2	3.6
250	1.2	3.6

0 3 . 4 Calculate value **X** in **Table 3**.

[1 mark]

X = _____ cm³/hour

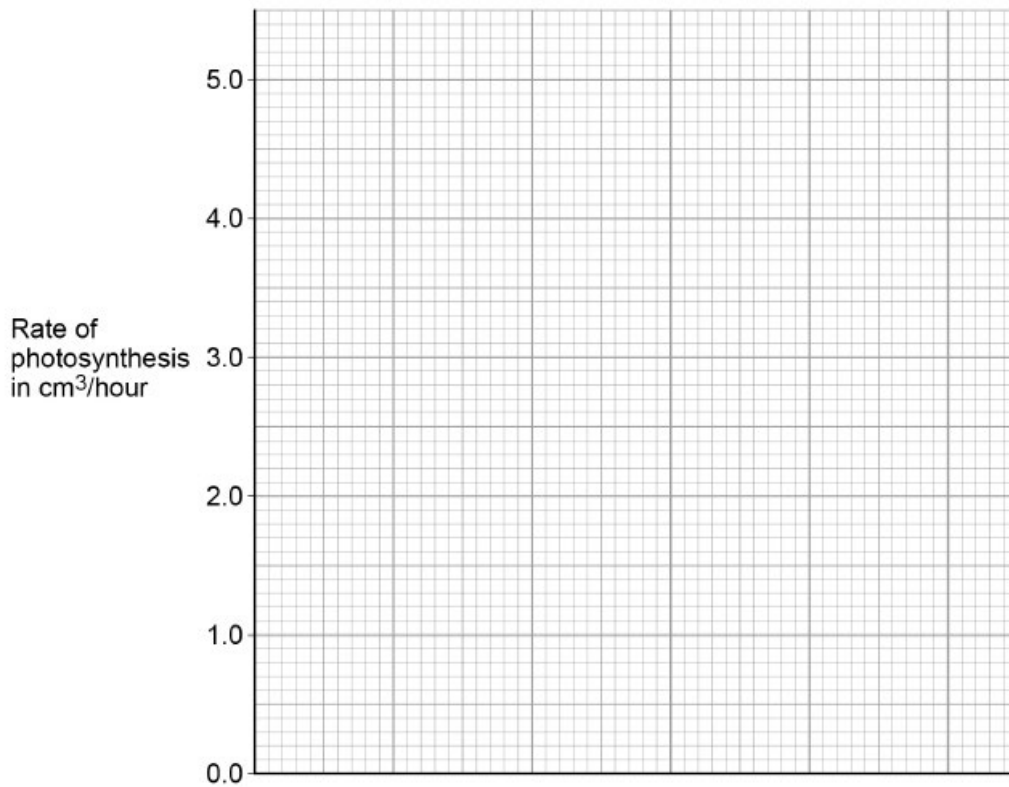
03.5 Complete **Figure 4**.

[4 marks]

You should:

- label the x-axis
- use a suitable scale
- plot the data from **Table 3** and your answer to Question **03.4**
- draw a line of best fit.

Figure 4



03.6 Determine the expected rate of photosynthesis with a bulb of power output 75 watts.

Use **Figure 4**.

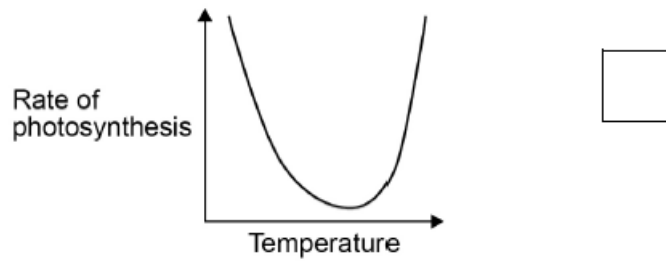
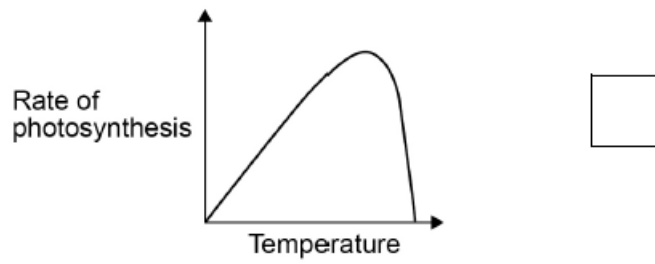
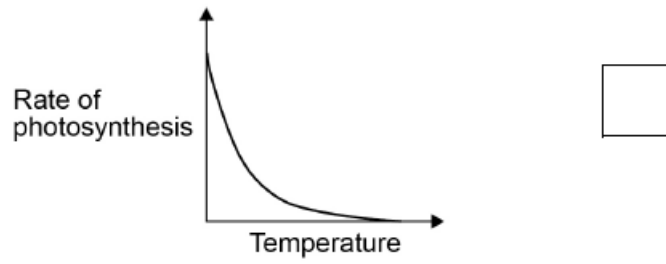
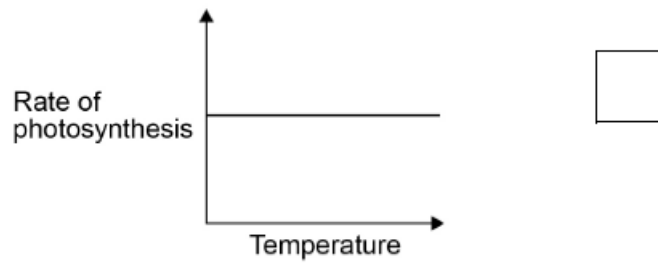
[1 mark]

Rate of photosynthesis at 75 watts = _____ cm³/hour

03.7

Which graph shows the effect of temperature on the rate of photosynthesis?

[1 mark]

Tick (✓) **one** box.

0 5

Many plants have evolved defence mechanisms.

Figure 8 shows part of a gorse plant and part of a deadly nightshade plant.

Figure 8



Gorse plant



Deadly nightshade plant

0 5 . 1

The gorse plant has evolved to have sharp thorns.

What type of defence response are thorns?

[1 mark]

0 5 . 2

How do thorns defend the gorse plant?

[1 mark]

0 5 . 3

The deadly nightshade plant has poisonous berries.

What type of defence response are poisonous berries?

[1 mark]

0 5 . 4

A scientist noticed that in one area the gorse plants had yellow leaves and had stunted growth.

One reason for yellow leaves and stunted growth is a deficiency of nitrate ions in the soil.

Explain **two** other possible reasons for the yellow leaves and stunted growth.

Do **not** refer to nitrate ions in your answer.

[5 marks]

Reason 1 _____

Explanation _____

Reason 2 _____

Explanation _____
