Practice Question Set For GCSE
Subject : Biology
Paper-1 Topic: B4 Bioenergetics

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Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Q1.

Plants absorb light to photosynthesise.

(a) What is the correct word equation for photosynthesis?

Tick **one** box.

carbon dioxide + glucose ⟶ oxygen + water ☐

glucose + oxygen ⟶ carbon dioxide + water ☐

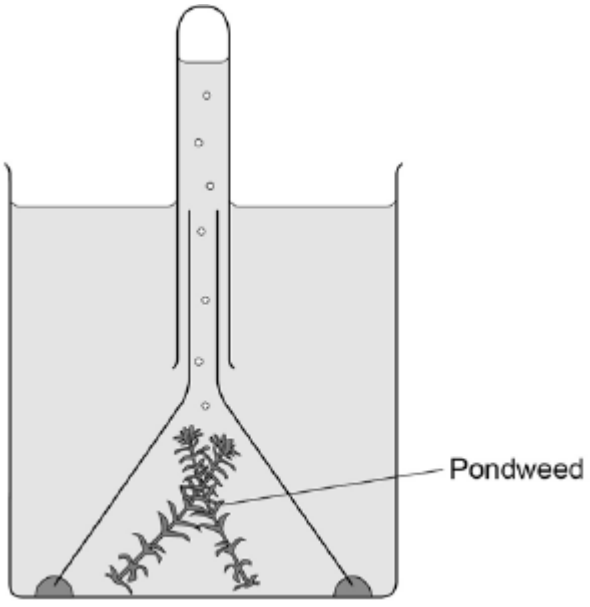
oxygen + water ⟶ carbon dioxide + glucose ☐

water + carbon dioxide ⟶ oxygen + glucose ☐

(1)

(b) **Figure 1** shows some of the apparatus that can be used to measure the rate of photosynthesis.

Figure 1



The rate of photosynthesis in the pondweed is affected by different colours of light.

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Describe a method you could use to investigate this.

You should include:

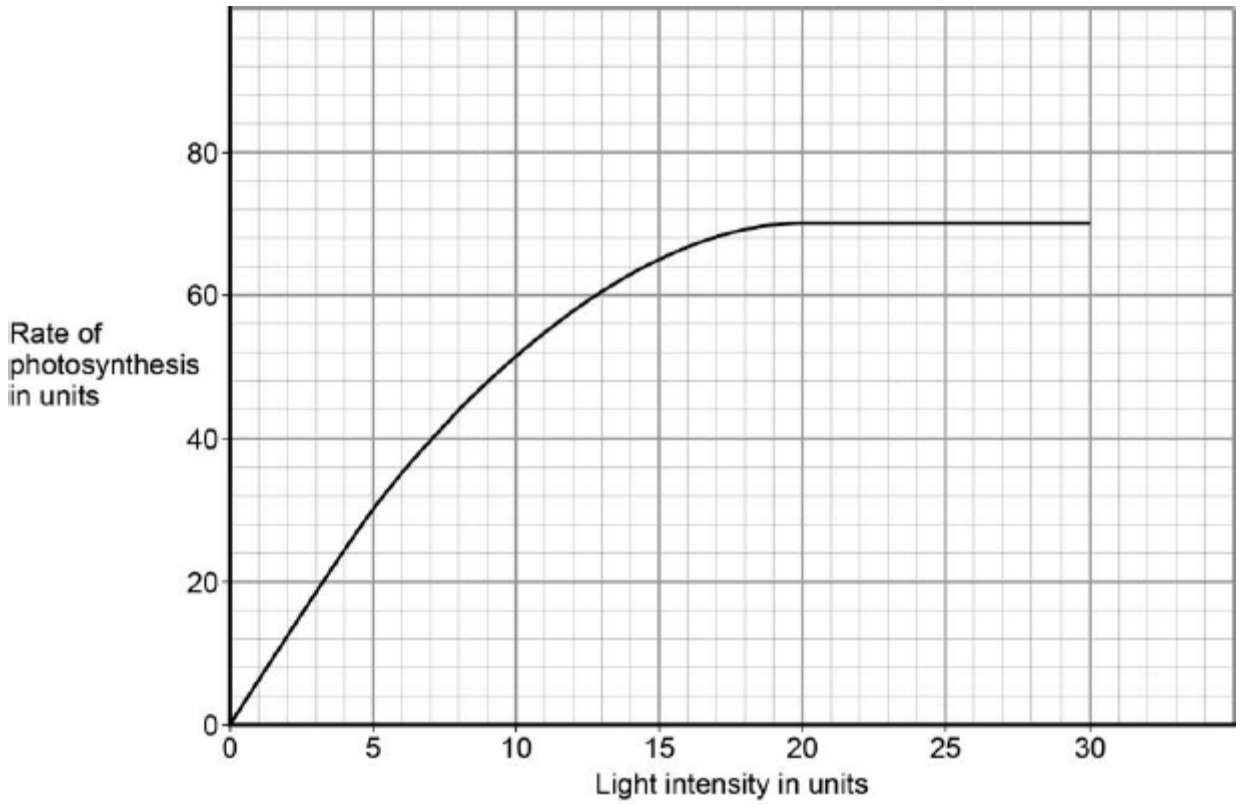
- what you would measure
- variables you would control.

(6)

(c) A scientist carried out a similar investigation.

Her results are shown in **Figure 2**.

Figure 2



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The scientist said:

'Light stops being a limiting factor at a light intensity of 20 units.'

Give evidence from **Figure 2** to support this statement.

_____

_____

(1)

(d) What could be limiting the rate of photosynthesis at a light intensity of 25 units?

Give **one** factor.

_____

(1)

(Total 9 marks)

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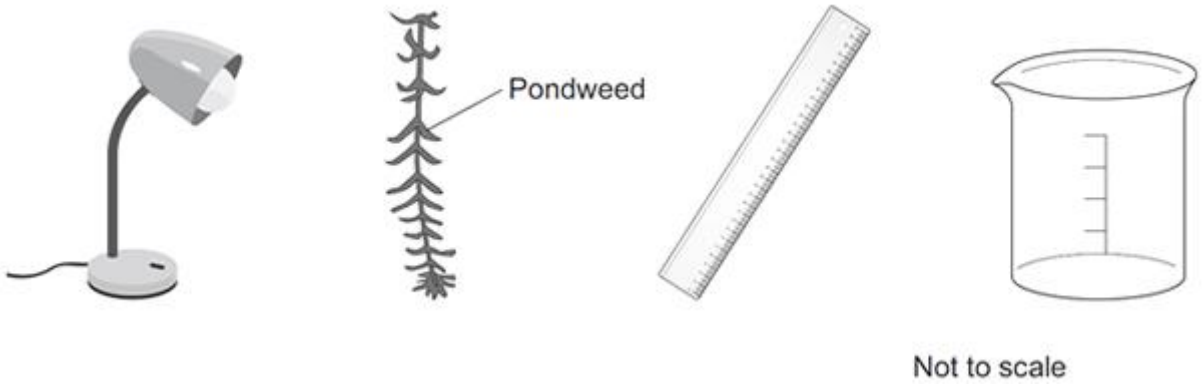
Q2.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Light intensity, carbon dioxide concentration and temperature are three factors that affect the rate of photosynthesis.

How would you investigate the effect of **light intensity** on the rate of photosynthesis?

The image below shows some of the apparatus you might use.



You should include details of:

- how you would set up the apparatus and the materials you would use
- the measurements you would make
- how you could make this a fair test.

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_____

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_____

_____

(Total 6 marks)

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Q3.

Photosynthesis needs light.

(a) Complete the **balanced symbol** equation for photosynthesis.

$6CO_2$ + _____ $\xrightarrow{\text{light}}$ _____ + $6O_2$

(2)

(b) A green chemical indicator shows changes in the concentration of carbon dioxide (CO_2) in a solution.

The indicator solution is **green** when the concentration of CO_2 is normal.

The indicator solution turns **yellow** when the concentration of CO_2 is high.

The indicator solution turns **blue** when the concentration of CO_2 is very low or when there is no CO_2.

The indicator solution does not harm aquatic organisms.

Students investigated the balance of respiration and photosynthesis using an aquatic snail and some pondweed.

The students set up four tubes, **A**, **B**, **C** and **D**, as shown in the table below.

The colour change in each tube, after 24 hours in the light, is recorded.

Tube A	**Tube B**	**Tube C**	**Tube D**
			
Indicator solution only	Indicator solution + pondweed	Indicator solution + snail	Indicator solution + pondweed + snail
Stays green	Turns blue	Turns yellow	Stays green

(i) What is the purpose of **Tube A**?

_____

_____

(1)

(ii) Explain why the indicator solution in **Tube C** turns yellow.

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_____

_____

_____

_____

(2)

(iii) Predict the result for **Tube D** if it had been placed in the dark for 24 hours and **not** in the light.

Explain your prediction.

Prediction _____

_____

Explanation _____

_____

_____

_____

(3)

(Total 8 marks)

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