LRN International GCSE: Combined Science (7160)

Candidate Name	
Candidate Number	
Centre Name	
Centre Number	

Paper 2: (Alternative to Practical)   **Sample Paper**

1 hour 30 minutes

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you can use a soft pencil (preferably of type B or HB) for diagrams, a clean eraser and a dark blue or black pen.

INSTRUCTIONS:
- You must write your name, candidate number, centre name and centre number on the answer sheets in the designated spaces.
- The paper consists of xx questions, and it is essential that you attempt all of them.
- Attempt all the questions using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.
- You are allowed to use a calculator if needed.
- A periodic table is found at the back of the paper.

INFORMATION:
- This paper has a total of 60 marks.
- The number of marks assigned for every question or its parts is indicated within brackets [ ].
- Rough work must be completed on this question paper.

Part A: Biology Section (20 Marks)

Question 1 (6 marks)

An investigation was conducted to determine the effect of light intensity on the rate of photosynthesis.

a) The diagram below shows a setup where a plant is placed in water under a lamp. Gaseous bubbles are released from the plant during photosynthesis.
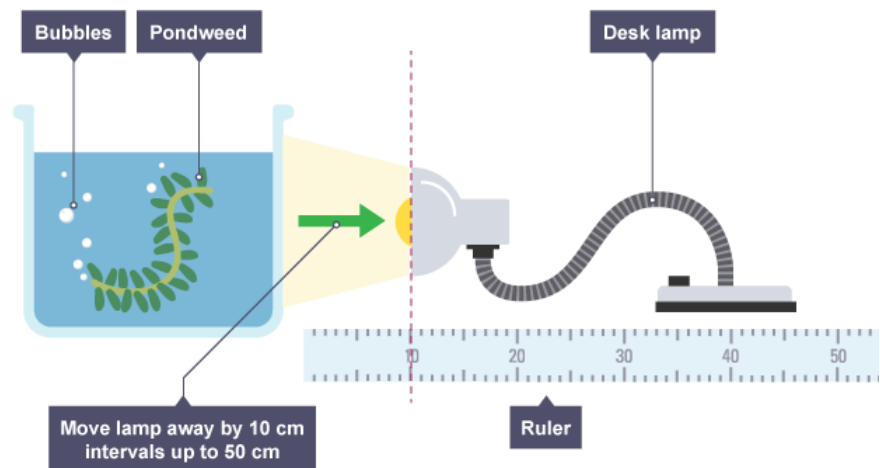
Image courtesy of the BBC

i) Name the gas being released. (1 mark)

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ii) Suggest how you would measure the rate of photosynthesis in this experiment. (2 marks)

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iii) Describe two variables that should be controlled to ensure reliable results. (2 marks)

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iv) State how you could make the light intensity lower in this setup. (1 mark)

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Question 2 (7 marks)

The table below shows the length of time it takes for starch to disappear when amylase is added to starch solutions at different temperatures.

Temperature (°C)	Time for starch to disappear (minutes)
20	25
30	15

Temperature (°C) Time for starch to disappear (minutes)

| 40 | 8 |
| 50 | 30 |

a) Plot a graph of temperature (x-axis) against time for starch to disappear (y-axis). (3 marks)
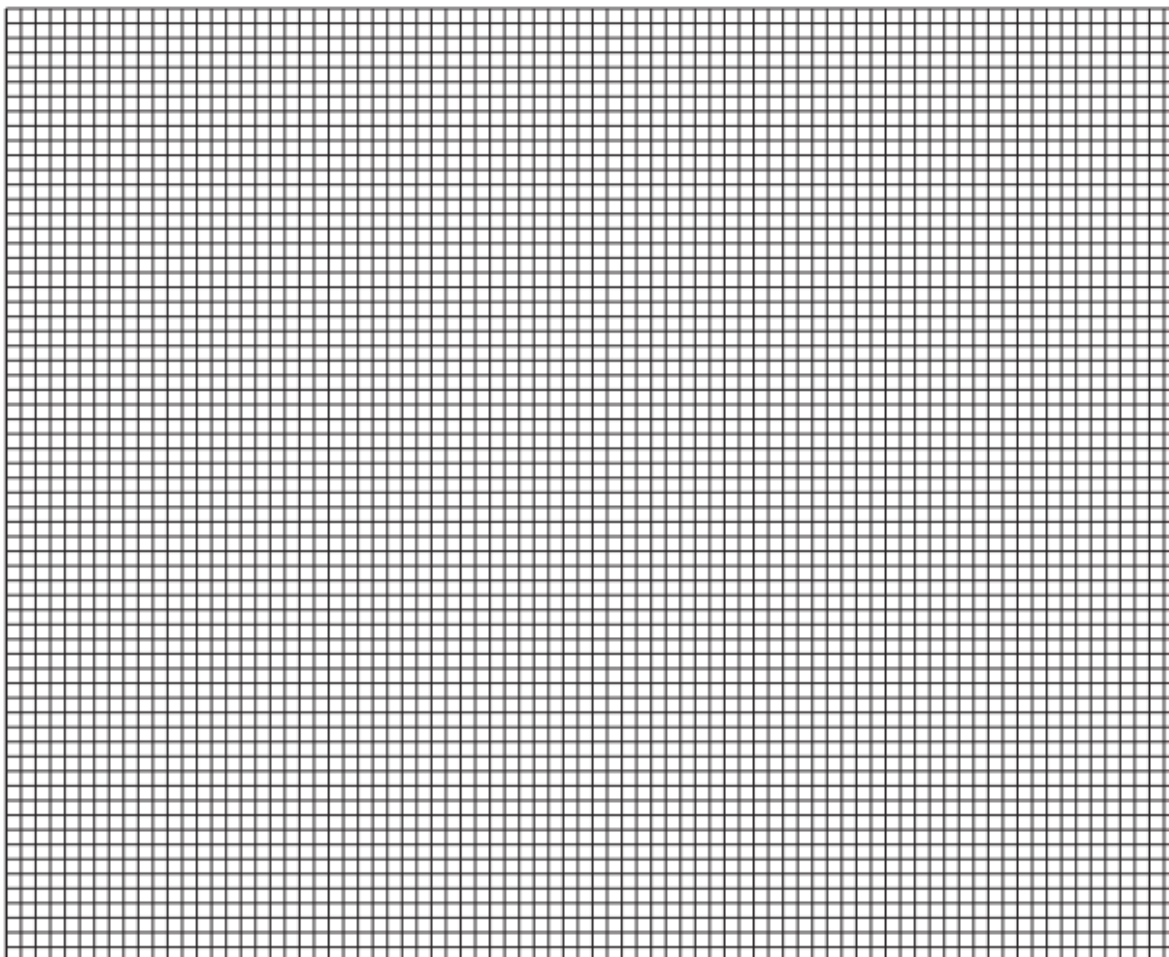
b) Explain the trend shown in the graph, referring to enzyme activity. (2 marks)

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c) At 50°C, the time for starch to disappear increases significantly. Suggest why. (1 mark)

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d) Suggest one improvement to this experiment. (1 mark)

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Question 3 (7 marks)

A student was asked to dissect a flower and identify its parts.

a) Name two safety precautions that should be followed during the dissection. (2 marks)

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b) Suggest two tools the student could use for dissecting the flower. (2 marks)

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c) The diagram below shows a section of the flower. Label the following:
i) Ovary, ii) Anther, iii) Petal. (3 marks)
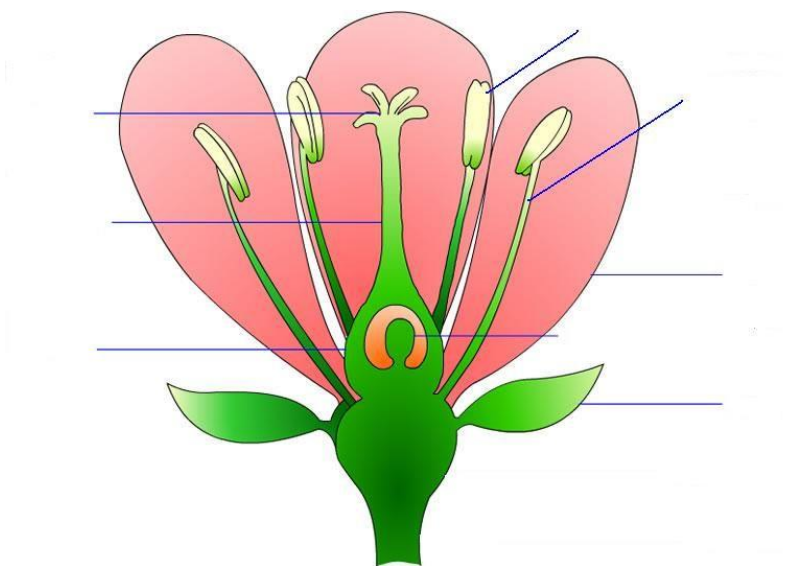
Part B: Chemistry Section (20 Marks)

Question 4 (6 marks)

A common chemical experiment is to investigate the thermal decomposition of copper(II) carbonate.

a) Write a word equation for the thermal decomposition of copper(II) carbonate. (2 marks)

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b) A limewater test was used to confirm the gas produced.

i) State the result of the limewater test if the gas is carbon dioxide. (1 mark)

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ii) Describe how you would safely carry out the limewater test. (2 marks)

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iii) Identify the solid residue remaining after the decomposition. (1 mark)

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Question 5 (7 marks)

A student is given four colorless solutions labeled A, B, C, and D.

- Solution A: Hydrochloric acid
- Solution B: Sodium hydroxide
- Solution C: Distilled water
- Solution D: Sodium chloride solution

a) Describe a test the student could use to identify Solution A. (2 marks)

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b) Outline a method to identify Solution D using silver nitrate. (2 marks)

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c) Explain why Solution C does not react with either A or B. (2 marks)

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d) Suggest why it is important to use clean apparatus during this experiment. (1 mark)

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Question 6 (7 marks)

The diagram below shows a typical electrolysis setup.

Molten Lead (II) Bromide
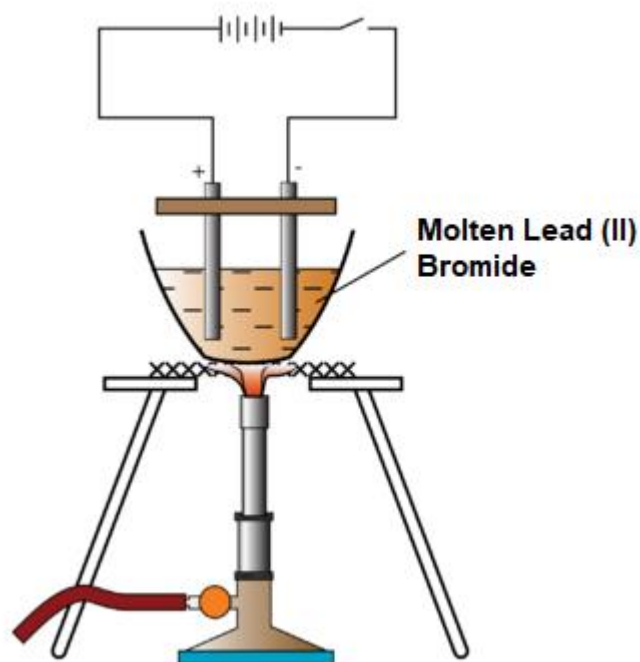
A student does an electrolysis experiment using molten lead(II) bromide.

a) Name the products formed at the:

i) Cathode (1 mark)

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ii) Anode (1 mark)

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b) Explain why the lead(II) bromide must be molten for electrolysis to occur. (2 marks)

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c) Suggest a suitable material for the electrodes and give a reason for your choice. (2 marks)

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d) State one safety precaution that should be followed during this experiment. (1 mark)

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Part C: Physics Section (20 Marks)

Question 7 (6 marks)

A student investigates the time period of a pendulum.

a) Describe how the student could accurately measure the time period of the pendulum. (3 marks)

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b) State two factors that affect the time period of the pendulum. (2 marks)

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c) The pendulum is swung in a room with a fan turned on. Suggest how this could affect the results. (1 mark)

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Question 8 (10 marks)

Draw a series circuit below containing a lamp, a resistor, and a battery. (3 marks)

a) State the function of the resistor in the circuit. (1 mark)

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b) The current through the lamp is measured using an ammeter.

i) Draw the correct position of the ammeter on the circuit diagram. (1 mark)

ii) Describe how you would use the ammeter to measure the current accurately. (2 marks)

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c) The resistance of the resistor is 5 Ω, and the battery provides a voltage of 10 V.

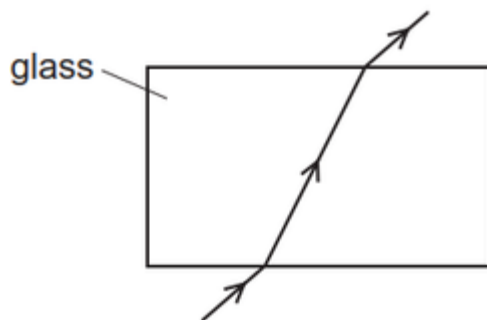i) Calculate the current flowing through the resistor. (2 marks)

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ii) State the unit of current. (1 mark)

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Question 9 (4 marks)

The diagram below shows a ray of light passing through a glass block.

c) The refractive index of the glass is 1.5. Calculate the speed of light in the glass if the speed of light in air is 3.0×10^8 m/s. (2 marks)

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d) State one precaution to ensure the accuracy of measurements in this experiment. (1 mark)

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e) Suggest why using a laser instead of a standard light source might improve the results. (1 mark)

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End of Paper