1.8 Biology Required Practicals and Data Analysis: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A separate group investigated the effect of light intensity on the rate of photosynthesis of pondweed, using a lamp at different distances from a boiling tube of pondweed in sodium hydrogencarbonate solution. (Photosynthesis: $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$, using light energy.)

(a) Identify the independent variable and the dependent variable in this investigation. **(2)**

(b) Name one variable, other than distance, that must be controlled in this investigation, and describe how it could be controlled. **(2)**

(c) State one hazard associated with using a lamp close to a water bath in this investigation, and a suitable control measure. **(2)**

(Total for Question 1 is 6 marks)

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Mark scheme · 1.8 Biology Required Practicals and Data Analysis: 10-minute Pack

Question 1

(a) independent variable: distance of the lamp from the pondweed (light intensity), oe **B1**

(a) dependent variable: rate of oxygen bubble production (bubbles produced per minute), oe **B1**

(a) Answer: Independent variable: distance of lamp from pondweed. Dependent variable: rate of bubble (oxygen) production.

(b) concentration of carbon dioxide, oe **B1**

(b) by using the same concentration of sodium hydrogencarbonate solution in every test, oe; allow temperature controlled by keeping the tube in a water bath, or using the same length/species of pondweed **B1**

(b) Answer: Carbon dioxide concentration, controlled by using the same concentration of sodium hydrogencarbonate solution each time.

(c) hazard: electric shock from mains equipment near water, or burns from the hot lamp bulb, oe **B1**

(c) control measure: keep electrical connections away from water/spillages, or allow the lamp to cool before handling / do not touch the bulb, oe **B1**

(c) Answer: Hazard: electric shock from the lamp near water. Control measure: keep the lamp's electrical connections away from any water and spillages.

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