

## **GCSE Biology A (Gateway)**

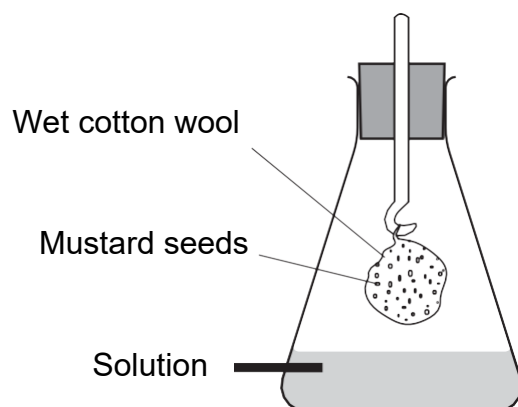
**J247/02 B4-B6 and B7 Foundation (Foundation Tier)**

### **Question Set 12**

1

A student investigates the effect of acid rain on seed growth.

- She soaks cotton wool in a solution with a pH value of 7.0.
- She puts 20 mustard seeds onto the cotton wool and places it inside a flask.
- She adds the same solution to the flask.
- She then repeats this four times using solutions with different pH values. One of the flasks is shown in the diagram.



After 8 days she counts how many of the seeds are growing.  
The table shows her results.

pH of solution	Number of the 20 seeds that are growing after 8 days
7.0	17
6.5	18
6.0	16
5.5	6
5.0	2

The student used 20 seeds in each flask.

- (a) Write down **one** other factor that the student should have kept the same in this investigation.

[1]

(b) Describe what this investigation shows about the effect of acid rain on seed growth. [2]

(c) One way to compare the growth of seeds is to use a germination index (**GI**).

Use the formula:  $GI = \frac{\text{mean root length} \times \text{number of seeds that are growing}}{\text{number of days}}$

(i) For the seeds at **pH 6.0**, the mean root length was 5 mm.

Calculate the **GI** for these seeds.

Answer =

[2]

(ii) Look at the equation for **GI**.

This is a better way of measuring the effect of acid rain on seed growth than just counting the number of seeds growing.

Explain why.

[1]

**Total Marks for Question Set 12: 6**

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