# AQA – Organisms respond to changes in their internal and external environments – A2 Biology

**1.** June/2021/Paper_2/No.2

**0 2 . 1** Explain how a resting potential is maintained across the axon membrane in a neurone.

**[3 marks]**

**0 2 . 2** Explain why the speed of transmission of impulses is faster along a myelinated axon than along a non-myelinated axon.

**[3 marks]**

**0 2 . 3** A scientist investigated the effect of inhibitors on neurones. She added a respiratory inhibitor to a neurone. The resting potential of the neurone changed from –70 mV to 0 mV.

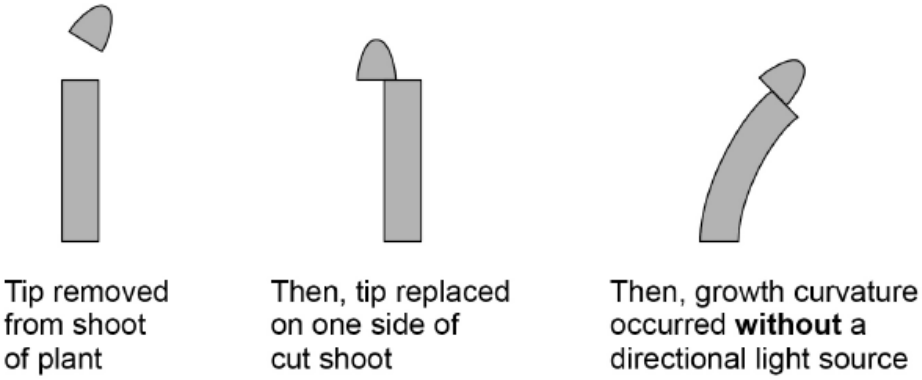
Explain why.

**[3 marks]**

**2.** June/2021/Paper_2/No.3

**0 3** **Figure 1** shows an investigation into growth factors in plants.

**Figure 1**




**0 3 . 1** Use your knowledge of indoleacetic acid (IAA) to explain the growth curvature shown in **Figure 1**.

**[3 marks]**

A bioassay is a method to determine the concentration of a substance by its effect on living tissues.

**Figure 2** shows the practical procedure used in a growth curvature bioassay to determine the concentration of IAA in shoot tips.

**Figure 2**

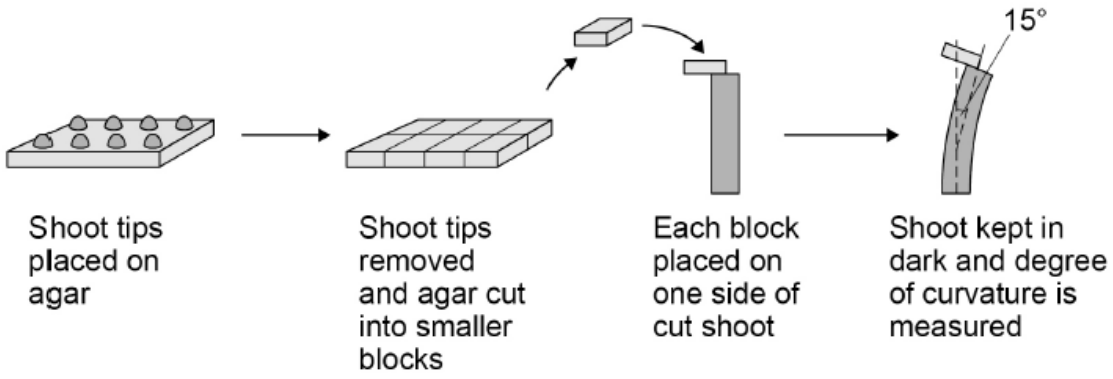
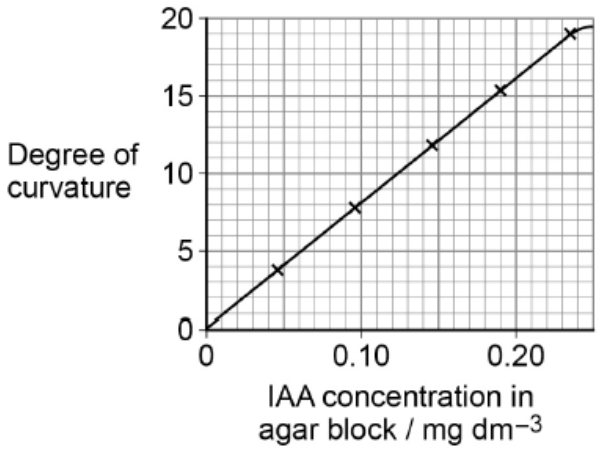



**Figure 3** shows the calibration curve for this growth curvature bioassay.

**Figure 3**



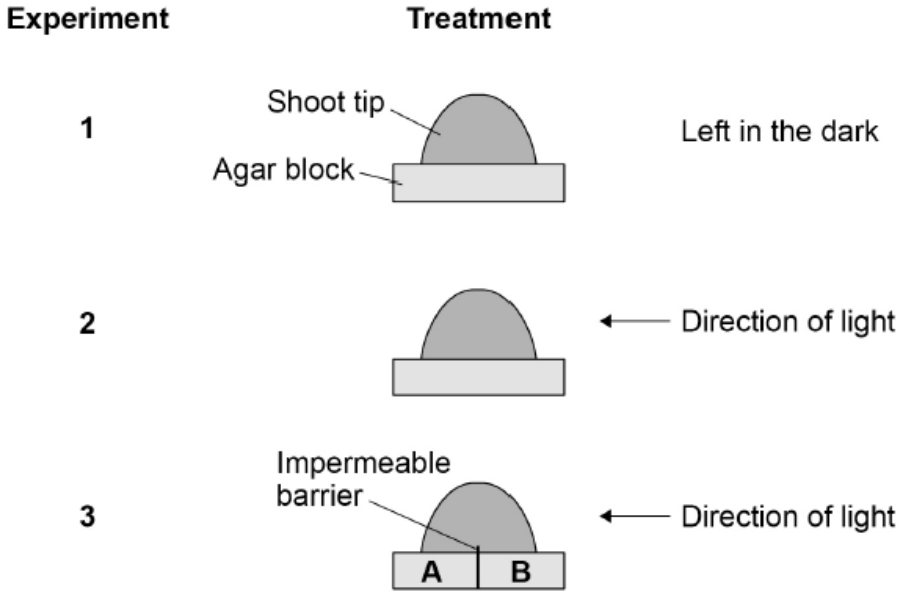
0 3 . 2 Using the procedure in **Figure 2** and the calibration curve in **Figure 3**, describe how you could compare the IAA concentration in shoot tips from two different plant species.

In your answer you should refer to all the variables that should be controlled to produce a valid comparison.

**[5 marks]**

A scientist investigated the effect of a directional light stimulus on the distribution of IAA in shoot tips. The scientist set up three experiments as shown in **Figure 4**. All variables were controlled apart from exposure to light.

**Figure 4**




She then used the growth curvature bioassay to compare the IAA concentrations in the agar blocks from:

- experiment **1**
- experiment **2**
- experiment **3** section **A**
- experiment **3** section **B**.

**Table 1** shows the scientist's results.

**Table 1**

| Experiment | Degree of curvature in Bioassay / degrees |
|---|---|
| **1** | 17.69 |
| **2** | 17.61 |
| **3A** | 11.22 |
| **3B** | 6.50 |

**0 3 . 3** State **two** conclusions about IAA that you can make from the results shown in **Table 1**.

**[2 marks]**

1 _____

_____

2 _____

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