

Cloning and biotechnology – 2021/20 GCE Biology A Component 02**1. Nov/2021/Paper_H420/02/No.21**

Plants have the ability to propagate themselves naturally by cloning. This ability is used by humans commercially when carrying out tissue culture.

- (a) Strawberry plants produce clones using runners. This is an example of natural cloning.

State **one** other method of natural cloning in plants.

..... [1]

- (b) Name the type of plant tissue from which natural clones are produced.

..... [1]

- (c) Tissue culture greatly increases the number of cloned plants that can be produced from a single parent plant.

Outline how it is possible to produce many clones from a single original parent plant.

.....

 [2]

- (d) Pineapples are plants that can be cloned by tissue culture.

Plant hormones are used during the tissue culture process. One of these plant hormones is known as BAP.

The table below shows the effect of the concentration of BAP on the length of pineapple shoots.

BAP concentration (mg dm^{-3})	Mean shoot length (mm)
0	33.8
1	27.5
2	23.6
3	30.8
4	37.0
5	49.9
6	26.4
7	22.3

- (i) Calculate the percentage increase in mean shoot length caused by adding 5 mg dm^{-3} BAP.

Give your answer to **2** significant figures.

Percentage increase = % **[2]**

- (ii) The valid investigation that generated the results shown above featured an independent variable, a dependent variable and several controlled variables.

State the independent and dependent variables and suggest **two** appropriate controlled variables.

Independent variable

Dependent variable

Controlled variables

1

2 **[3]**

2. Nov/2020/Paper_H420/02/No.12

Which of the following, **A** to **D**, is **not** true about adult stem cells?

- A** They are found in bone marrow.
- B** They are not specialised.
- C** They are totipotent.
- D** They can be used as a renewing source of undifferentiated cells.

Your answer ☐

[1]