

**OCR**

**A Level**

# **A Level Biology**

**Biotechnology Cloning Answers**

Name:

**M M E**

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**Total Marks: /20**

## Biotechnology - Cloning

| Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Marks                                                       |
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| <p>1.</p> <p>a)</p> <p>i) Meristems – part of the plant with the most rapid growth.</p> <p>ii) Cytokinins – shoot growth<br/>Auxins – root growth</p> <p>iii) – All the conditions can be closely monitored<br/>-There are no limiting factors to affect growth rate<br/>-The conditions are sterile so no microbe spread will affect plant growth</p> <p>iv) <u>Advantages:</u><br/>- desirable features can be easily reproduced<br/>-Only a small amount of tissue is needed<br/>-Only one parent plant is needed<br/>-Sterile environment means there are no diseases<br/>-Produces stronger plants<br/>-Plants are smaller in early stages and easier to transport</p> <p><u>Disadvantages:</u><br/>- If clones are susceptible to a disease the whole population could be wiped out<br/>- Fewer plants are produced compare to seedling use<br/>- Conditions can be expensive to maintain<br/>- Hard to create a sterile environment</p> | <p>2 marks</p> <p>2 marks</p> <p>2 marks</p> <p>6 marks</p> |

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| <p>2.<br/>a)<br/>i) – when a fertilised egg/ embryo splits in two forming identical twins</p> <p>b)<br/>i) – the nucleus of a somatic cell (that has the desirable characteristics) is removed and the cell is discarded<br/>-The nucleus in an egg cell is removed and discarded<br/>-The nucleus from the somatic cell is inserted into the egg.<br/>- Electrical stimulation.<br/>-The somatic cell nucleus is then reprogrammed by the host cell<br/>-Mitosis occurs eventually forming an embryo</p> <p>ii) <u>Advantage</u> :<br/>-Personalised medicine cells/tissues can be made to treat individuals using their own DNA<br/>-Medical treatments could benefit millions of individuals</p> <p><u>Disadvantage</u>:<br/>- Many eggs would be needed for the widespread use of these treatments<br/>- Involve destruction of DNA from an egg that could have formed an embryo<br/>- Ethical implications of cloning humans if the proper regulations are followed.</p> | <p>1 mark</p> <p>5 marks</p> <p>2 marks</p> |
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