

Biotechnology: practice questions

8 questions · 26 marks · mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 26

- 1** Bacteria are widely used in biotechnology and genetic modification. State two features of bacteria that make them useful. [2 marks]

- 2** **Supplement** [2 marks]
Apart from their rapid reproduction and their ability to make complex molecules, bacteria are useful in genetic modification for other reasons. Explain two of these other reasons.

- 3** Ethanol can be produced by yeast for use as a biofuel. Describe the role of anaerobic respiration in yeast in this process. [3 marks]

- 4** Bakers add yeast to dough and leave it in a warm place before baking. Describe and explain what happens to the dough, and to the substances made by the yeast, during bread-making. [4 marks]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [2]

- rapid reproduction rate / reproduce quickly (1)
- (able to) make complex molecules (1) allow named example e.g. proteins

2. [2] **Supplement**

- few ethical concerns over their manipulation / growth (1)
- have plasmids (1)
- (plasmid) can have a gene inserted / can carry the gene into the bacterium (1)
- Max 2

3. [3]

- yeast respire without oxygen / anaerobically (1) ignore 'ferments' alone
- breaks down sugar / glucose (1)
- to produce ethanol / alcohol (and carbon dioxide) (1)
- ethanol is separated and used as a fuel (1)
- Max 3

4. [4]

- yeast respire anaerobically (1)
- producing carbon dioxide (1)
- bubbles of gas trapped in the dough make it rise (1) reject ethanol makes the dough rise
- gas bubbles expand when baked (1)
- ethanol / alcohol is also produced and evaporates during baking (1)
- Max 4

5. [1]

B B (1)

6. [6]

- (a) protease (1) reject lipase / amylase
- (b) size / type of cloth (1)
- amount / volume of egg white stain (1)
- volume of water / solution (1)
- mass / concentration of washing powder (1)
- pH / amount of stirring (1)
- Max 2 for (b)
- (c) time taken for the stain to disappear (1) allow how much stain is left after a fixed time
- (d) enzyme / protease is denatured (1)
- active site changes shape, so protein / substrate no longer fits (1)

7. [3] Supplement

- lactase is an enzyme added to milk (1)
- it breaks down lactose (1)
- into glucose and galactose (both needed) (1)
- so people who are lactose intolerant can drink / digest it (1)
- Max 3

8. [5] Supplement

- (a) fungus / *Penicillium* (1)
- insulin / mycoprotein (1)
- (b) temperature kept at the optimum using a water jacket / cooling water (1)
- heat released by respiration is removed / temperature monitored by a probe (1)
- so enzymes work fast and are not denatured (1)
- sterile air is pumped / bubbled in (1)
- stirrer spreads oxygen through the culture (1)
- oxygen for aerobic respiration, releasing energy for growth (1)
- Max 3 for (b)