Biotechnology and genetic modification – 2020 IGCSE 0610

1. Nov/2020/Paper_13/No.38

Genes can be inserted into crop plants to make them resistant to herbicides.

Which process is this an example of?

A antibiotic resistance

B genetic engineering

C natural selection

D selective breeding

2. Nov/2020/Paper_21/No.38

Which are reasons why bacteria are often useful in biotechnology?

1 lack of ethical concerns over their manipulation and growth

2 they have the same genetic code as all other organisms

3 their DNA is located in a nucleus that can easily be altered with enzymes

A 1 and 2 only **B** 1 and 3 only **C** 1, 2 and 3 **D** 2 and 3 only

3. Nov/2020/Paper_22/No.38

The stages describe how genetic engineering can be used to produce human insulin from bacteria.

1 cut bacterial plasmid DNA with restriction enzymes

2 extract gene for insulin from human DNA with restriction enzymes

3 insert recombinant plasmid into bacteria

4 join human DNA to bacterial plasmid DNA using DNA ligase

5 replicate bacteria containing recombinant plasmid

Which sequence will lead to the production of human insulin by bacteria?

A $2 \rightarrow 1 \rightarrow 4 \rightarrow 3 \rightarrow 5$

B $2 \rightarrow 5 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C $4 \rightarrow 2 \rightarrow 3 \rightarrow 1 \rightarrow 5$

D $4 \rightarrow 3 \rightarrow 5 \rightarrow 1 \rightarrow 2$

4. Nov/2020/Paper_23/No.38

Bacteria are used to make insulin.

This happens in several stages.

1 bacteria synthesise insulin in fermenters

2 the insulin gene is inserted into a bacterial plasmid

3 removal of the insulin gene from a human chromosome

4 a section of a plasmid is removed

In which order do these stages occur?

A $1 \rightarrow 3 \rightarrow 2 \rightarrow 4$

B $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$

C $4 \rightarrow 2 \rightarrow 3 \rightarrow 1$

D $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$