

# 2023 Bi H1 Q16

## Section: Metabolism and Survival

## Topic: Genetic Control of Metabolism

### Question Summary

The question asks which restriction enzymes would be used to remove a desired gene from a chromosome based on the pattern of restriction sites shown in the diagram.

### Worked Solution

The diagram shows restriction sites labelled H (HindIII), E (EcoR1), and B (BamH1) on the chromosome. The desired gene lies between two BamH1 sites, meaning it can be cut out cleanly using BamH1 at both ends. Restriction enzymes act as molecular scissors, recognising specific short DNA sequences and cutting at those points. To remove a gene precisely, you must use the enzyme(s) whose recognition sites are located on either side of the gene.

■ Answer: C — BamH1

### Revision Tips

- Restriction enzymes cut DNA at specific recognition sequences.
- The same enzyme should cut both the source DNA and the plasmid to create complementary sticky ends.

- DNA ligase seals the sugar-phosphate backbone after insertion.
- Common enzymes include EcoR1, HindIII, BamH1.
- Always choose the enzyme(s) that flank the target gene region.