

Mark Scheme

1. B

a	Same/complementary sticky ends OR Complementary/matching base sequence/bases	1	NOT - enzyme cuts in same place in plasmid and chromosome  NOT - same bases/ base sequence
b	(DNA) ligase	1	
c	In the presence of antibiotic only these/modified bacteria grow/survive OR Converse	1	NOT - modified plasmids survive in presence of antibiotic
d	Origin of replication	1	

e i)      **It/protein/polypeptide is folded incorrectly**      1

e ii	Use yeast/put modified plasmid into yeast  OR  chemically modify protein	1
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3.

a	<p>Name: restriction endonuclease (1)</p> <p>Function: Cuts DNA/ genes out OR Cuts plasmid (1)</p> <p>OR</p> <p>Name: Ligase (1)</p> <p>Function: Joins/seals/inserts gene into plasmid OR Joins/seals/ sticky ends of plasmid and gene (1)</p>	2	<p>NOT - cuts gene from plasmid</p> <p>NOT - <u>to</u> plasmid</p> <p>NOT - joins sticky ends alone</p> <p>NOT - joins together gene and plasmid</p>
b i	<p>Grow/culture with ampicillin/ antibiotic (1)</p> <p>Only cells containing the plasmid/that gene/transformed cells/modified cells can grow/survive (1)</p>	2	<p>NOT - only plasmids with gene survive</p> <p>NOT - only resistant cells survive</p>

c

Eliminates/kills...  
other/contaminating/unwanted...  
microorganisms/bacteria  
OR  
Eliminates competition from...  
other/unwanted...  
microorganisms/bacteria  
OR  
So only insulin-producing  
bacteria can grow

NOT - contamination alone  
NOT - answers relating to idea  
of patient safety

NB: germs  $\neq$  microorganisms

NOT - Reduces contamination  
by other microorganisms