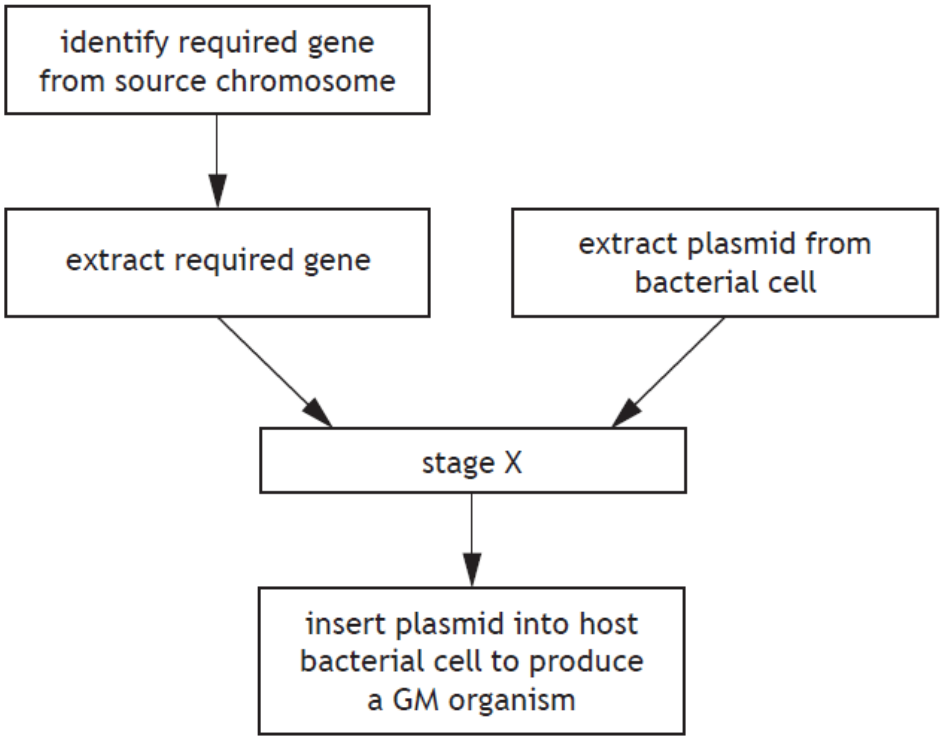
Unit 1 Cell Biology Revision Questions

Key Area 5 Genetic Engineering

1. The flowchart represents some of the stages of genetic engineering.



A suitable description of stage X would be

A insert bacterial plasmid into required gene

B insert bacterial plasmid into source chromosome

C insert required gene into host bacterial cell

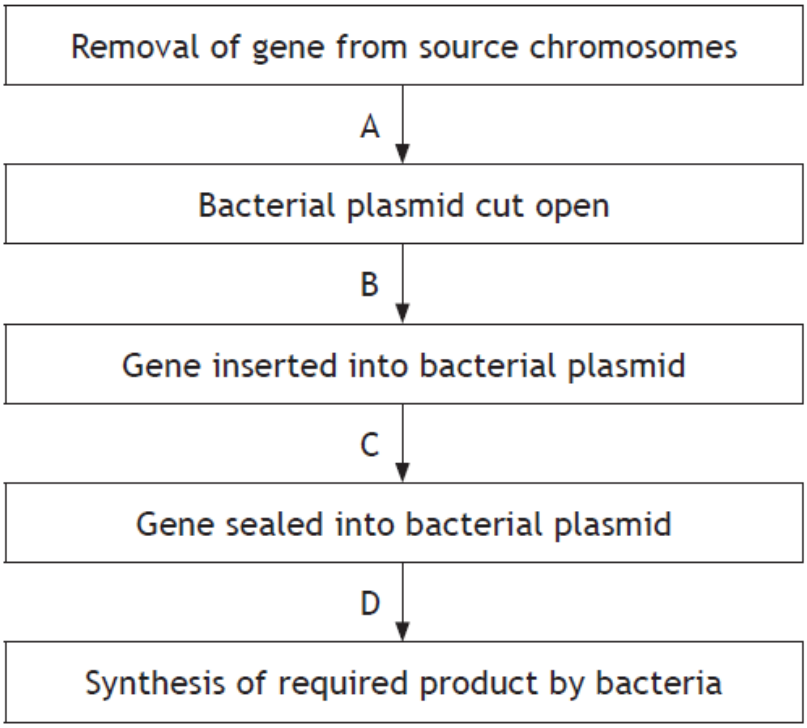
D insert required gene into bacterial plasmid.

2.

Which row in the table identifies the order of stages involved in genetic engineering?

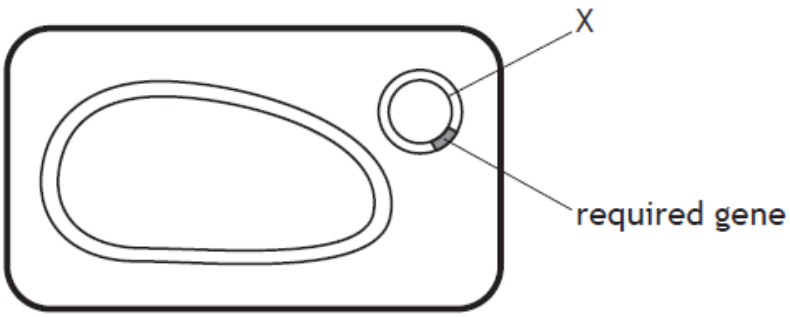
	Stage in Genetic Engineering			
	1st	2nd	3rd	4th
A	Required gene identified	Gene and plasmid extracted	Gene inserted into plasmid	Modified cells grown
B	Required gene identified	Gene inserted into plasmid	Gene and plasmid extracted	Modified cells grown
C	Gene inserted into plasmid	Required gene identified	Modified cells grown	Gene and plasmid extracted
D	Gene inserted into plasmid	Modified cells grown	Gene and plasmid extracted	Required gene identified

3. Some stages of genetic engineering are shown below.



Which letter indicates the stage where the plasmid is inserted into a bacterial cell?

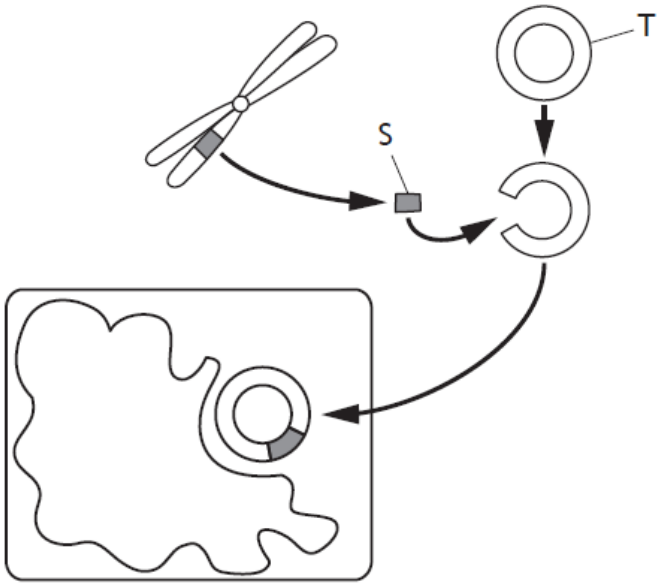
4. The diagram below represents a genetically engineered bacterial cell.



The structure labelled X is a

A chromosome
B plasmid
C ribosome
D nucleus.

5. The diagram shows stages in the production of a substance by genetic engineering.



Which row in the table identifies S and T?

	S	T
A	Gene	Plasmid
B	Gene	Bacterium
C	Chromosome	Plasmid
D	Chromosome	Bacterium

6. In the United States of America, 95% of the sugar beet plants grown have been genetically modified (GM).

The simple, whole number ratio of GM plants grown to non-GM plants is

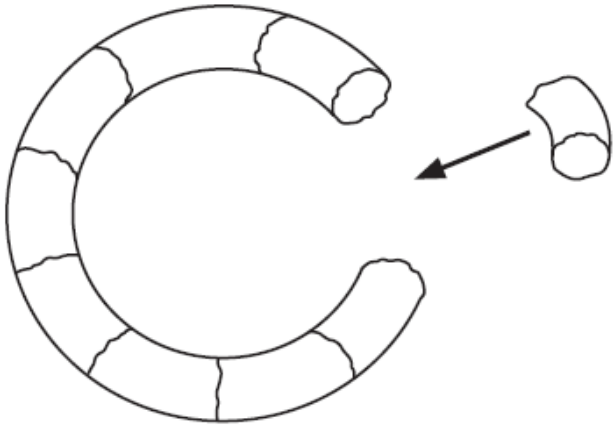
A 20:1

B 1:20

C 19:1

D 1:19

7. Which stage in the production of human insulin by genetic engineering is represented in the diagram below?



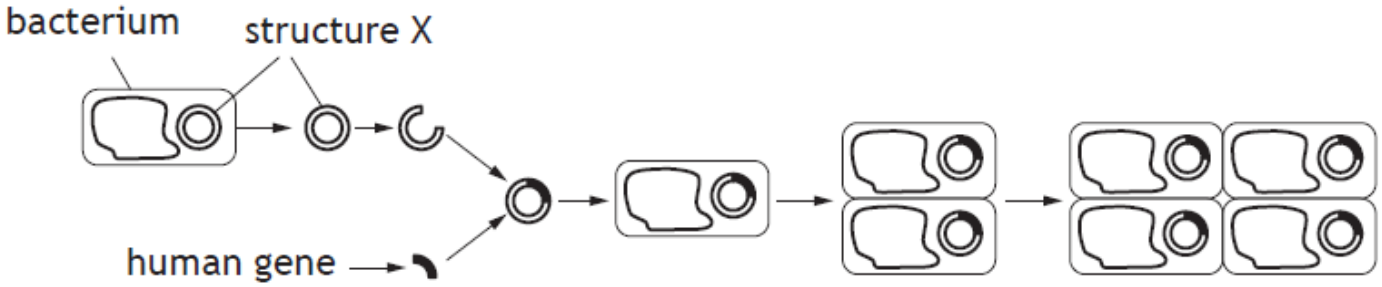
A Human gene is inserted into a plasmid.

B Human gene is inserted into a bacterium.

C Plasmid is inserted into a human chromosome.

D Bacterial gene is inserted into a human chromosome.

8. The diagram below represents part of the process of genetic engineering.



(a) (i) Structure X is removed from the bacterium and modified during this process.

Name structure X. 1

_____

(ii) The bacteria have an initial concentration of 1000 cells/cm^3.

Each cell divides once every 30 minutes.

Calculate how long it will take for the concentration to become greater than 15 000 cells/cm^3. 1

Space for calculation

_____ hours

(b) The genetically modified bacteria are grown in a fermenter.

(i) Explain why the fermenter must be sterilised using aseptic techniques before it is used. 1

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_____

(ii) The fermenter is controlled to provide optimum conditions.

Name one factor which can be controlled. 1

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