Genetic Engineering

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

![Diagram of a bacterial cell with a circular structure labeled X and a smaller circular structure labeled required gene.]

The structure labelled X is a

A chromosome
B plasmid
C ribosome
D nucleus.
3. Which row in the table identifies the order of stages involved in genetic engineering?

<table>
<thead>
<tr>
<th>Stage in Genetic Engineering</th>
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</thead>
<tbody>
<tr>
<td>1st</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
</tbody>
</table>

6. 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.
3. 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.  

(ii) The bacteria have an initial concentration of 1000 cells/cm³.
Each cell divides once every 30 minutes.
Calculate how long it will take for the concentration to become greater than 15 000 cells/cm³.

Space for calculation

______________ hours