



# BIOLOGY

## BOOKS - CBSE COMPLEMENTARY MATERIAL BIOLOGY (HINGLISH)

### BIOTECHNOLOGY: PRINCIPLES AND PROCESSES

Vsa

1. Write conventional nomenclature of EcoRI.



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2. An extra chromosomal segment of circular DNA is used to carry gene of interest into the host cell. What is the name given to it ?



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3. Mention the uses of cloning vector in biotechnology.



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4. Identify the recognition sites in the given sequences at which E-coli will cut and make sticky ends.

5'G $\nabla$ TC-3'

3'CT $\nabla$ GA-5'



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1. Name two main steps which are collectively referred to as down streaming process.why is this process significant ?



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2. How does plasmid differ from chromosomal DNA ?



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3. (A) bacterial cell is shown in the figure given below, label the part (A) and

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4. (B) Also ,mention the use of part'A' in rDNA technology.



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5. In the given process of separation and isolation of DNA fragments, some of the steps are missing, Complete the missing steps

A: Restriction digestion of DNA fragments



B: .....



C: Staining with ethidium bromide



D: Visualisation in U.V. light



E: .....



F: Purification of DNA fragments.



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1. since DNA is a hydrophilic molecule, it cannot pass through cell membranes.

Name and explain the technique with which DNA is forced into (i) a bacterial cell (ii) a plant cell (iii) an animal cell.



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2. In recombinant DNA technology, vectors are used to transfer a gene of interest in the host cells. Mention any three features of vectors that are most suitable for this purpose.



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3. Why is "Agrobacterium-mediated genetic engineering transformation" most suitable for this purpose.





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4. Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following questions.

$5CAG\downarrow TCTA - 3$

$3 - GTC\uparrow \downarrow G\downarrow T - 5$

(a) Name of restriction enzyme which can recognise this DNA sequence.



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5. Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following questions.

$5\text{CAG}\nabla\text{TC}\text{TA} - 3$

$3 - \text{GTC}\text{TVG}\nabla\text{TV} - 5$

(b) Write the sequence after digestion.



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6. Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following questions.

5CAG $\forall$  T C T A – 3

3–GTC T  $\forall$ G $\forall$ T – 5>br> Why are the ends generated after digestion called sticky ends?



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7. A selectable marker is used in the selection of recombinants on the basis of their ability to produce colour in presence of chromogenic substrate.

(a) Mention the name of mechanism involved.



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8. A selectable marker is used in the selection of recombinants on the basis of their ability to produce colour in presence of chromogenic substrate.

(b) Which enzyme is involved in production of colour ?



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9. A selectable marker is used in the selection of recombinants on the basis of their ability to produce colour in presence of chromogenic substrate.

(c ) How is it advantageous over using antibiotic resistant gene as a selectable marker?



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**10.** The development of bioreactors is required to produce large quantities of products.

(a) Give optimum growth conditions used in bioreactors.



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**1.** The development of bioreactors is required to produce large quantities of products.

(b) Draw a well labelled diagram of simple stirred-tank bioreactor.



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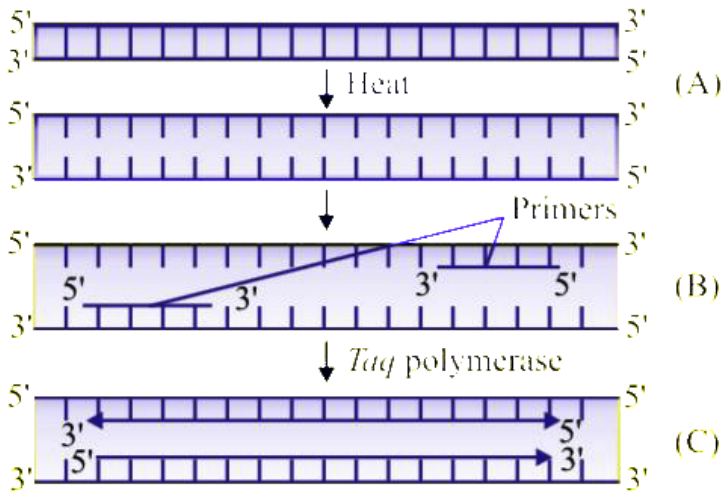
2. The development of bioreactors is required to produced large quantities of products.

(c ) How does a simple stirred tank boreator differ from sparged stirred tank bioreactor?



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3. In the given figure, one cycle of polymerase chain reaction (PCR) is shown:



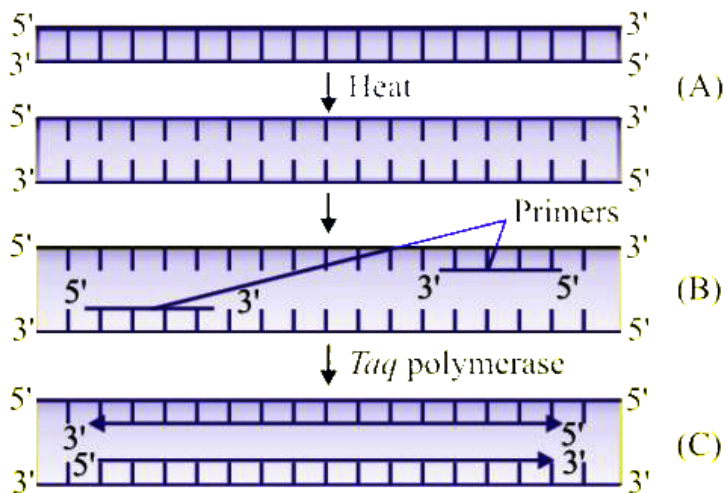
(a) Name the steps A,B and C.



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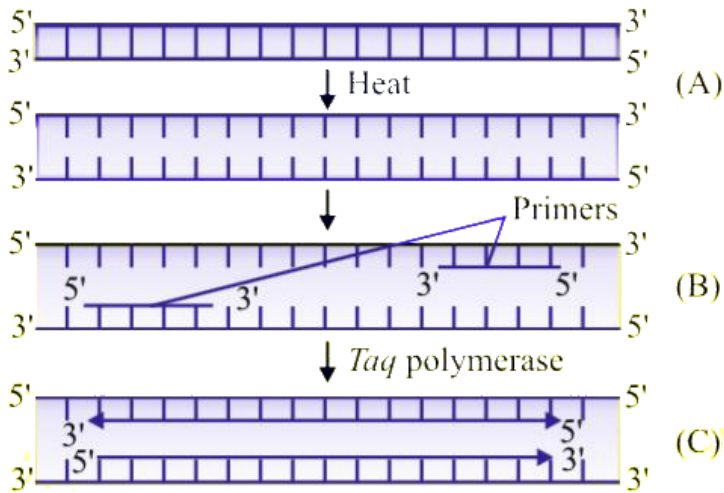
4. In the given figure, one cycle of polymerase chain reaction (PCR) is shown:



(b) Give the purpose of each of these steps.

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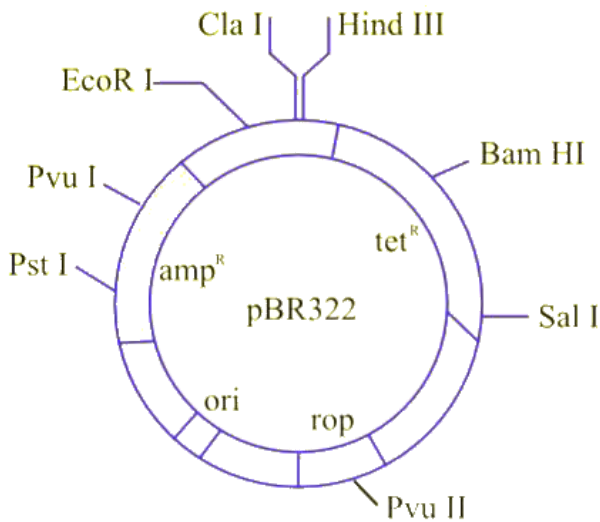
5. In the given figure, one cycle of polymerase chain reaction (PCR) is shown:



(c ) State the contribution of *Thermus aquaticus* in this process.

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6. Study the figure of vector pBR322 given below in which foreign DNA is ligated at the Bam HI site of tetracycline resistance gene.

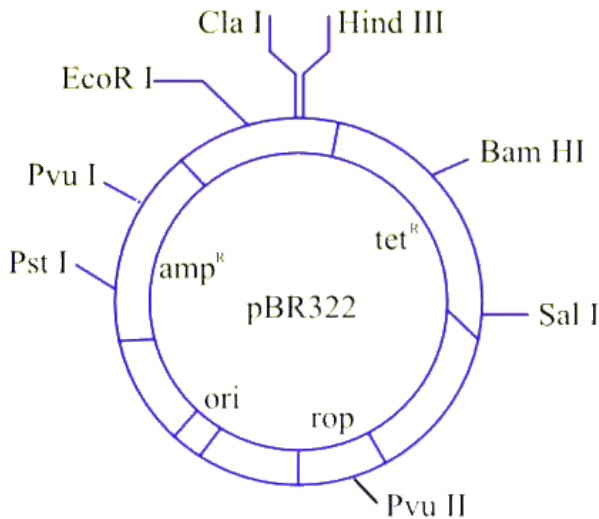


(a) Mention the function of rop.



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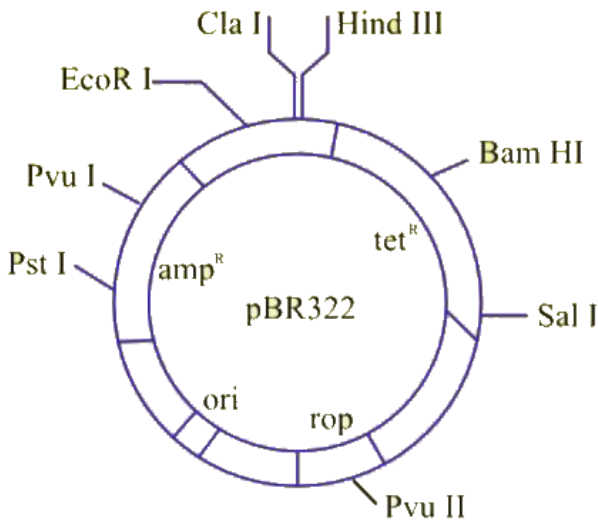
7. Study the figure of vector pBR322 given below in which foreign DNA is ligated at the Bam HI site of tetracycline resistance gene.



(b) What will be the selectable marker for this recombinant plasmid and why?

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8. Study the figure of vector pBR322 given below in which foreign DNA is ligated at the Bam HI site of tetracycline resistance gene.



(c) Explain transformation.



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