



# BIOLOGY

## BOOKS - MBD -HARYANA BOARD

### PRINCIPLES AND PROCESSES IN BIOTECHNOLOGY

#### Example

1. Can you list 10 recombinant proteins which are used in medical practice? Find where they

are used as therepeutics(Use the internet).



**Watch Video Solution**

2. Give a brief account of application of biotechnolgy in medicines.



**Watch Video Solution**

3. Make a chart showing a restiction enzyme,the sugbstrate DNA on which it

acts, the site at which it cuts DNA and the product it produces.



**Watch Video Solution**

4. Whatever you have learnt from class XI, can you tell whether enzymes are bigger or DNA is bigger in molecular size ?



**Watch Video Solution**

5. What would be the molar concentration of human DNA in a human cell? Consult your teacher.



[Watch Video Solution](#)

6. Do eukaryotic cells have restriction endonucleases?



[Watch Video Solution](#)

7. Besides better aeration and mixing properties ,what other advantages do stirred tank bioreactors have over shake flasks?



[Watch Video Solution](#)

8. Collect the examples of palindromic sequences by consulting your teacher ,Better try to create a palindromic sequence by following base pair rules.



[Watch Video Solution](#)

9. From what you have learnt ,can you tell whether enzymes are bigger or DNA is bigger in molecular size .How did you know?



[Watch Video Solution](#)

10. Describe briefly the following:

Origin of replication



[Watch Video Solution](#)

**11. Describe briefly the following:**

Downstream processing



**Watch Video Solution**

**12. Describe briefly the following:**

bioreactor



**Watch Video Solution**

**13. Explain briefly the following**

PCR



[Watch Video Solution](#)

**14.** Explain briefly the following

Restriction enzymes and DNA



[Watch Video Solution](#)

**15.** Explain briefly the following

Chitinase.



[Watch Video Solution](#)



**16.** Discuss with your teacher and find out how to distinguish between

Plasmid DNA and chromosomal DNA



**Watch Video Solution**

**17.** Discuss with your teacher and find out how to distinguish between

RNA and DNA



**Watch Video Solution**

**18.** Discuss with your teacher and find out how to distinguish between Exonuclease and Endonuclease.



**Watch Video Solution**

**19.** What is genetic engineering?



**Watch Video Solution**

**20.** Define recombinant DNA.



**Watch Video Solution**

**21.** Name any for restriction enzymes.



**Watch Video Solution**

**22.** What is the role of restriction endonuclease?



**Watch Video Solution**

**23.** Define plasmid.



**Watch Video Solution**

**24. What are BACs and YACs ?**



**Watch Video Solution**

**25. Name the soil bacterium which contain gene for production of endotoxins.**



**Watch Video Solution**

**26.** How elution of DNA is done?



**Watch Video Solution**

**27.** Name a microbe which can transform cells.



**Watch Video Solution**

**28.** Before integrating DNA with bacterial plasmid, Bacteria cells are treated with calcium. Why?



[Watch Video Solution](#)

**29.** Give an example in which recombinant DNA technology has provided broad range tools in diagnosis of diseases.



[Watch Video Solution](#)

**30.** Name different E.coli plasmids that are used as vectors.



[Watch Video Solution](#)

**31.** Give the full form of PCR. Who developed it?



**Watch Video Solution**

**32.** What is the source of DNA polymerase  
i.e., Taq polymerase?



**Watch Video Solution**

**33.** Name the DNA polymerase which is usually used for PCR.



**Watch Video Solution**

**34.** Define "melting of target DNA".



**Watch Video Solution**

**35.** How many PCR cycles are adequate for proper amplification of DNA segment?





**Watch Video Solution**

**36.** What can be the source of thermostable DNA?



**Watch Video Solution**

**37.** Name two enzymes involved in PCR.



**Watch Video Solution**

**38.** What are selectable markers?



**Watch Video Solution**

**39.** What is recombinant proteins?



**Watch Video Solution**

**40.** Name two types of bioreactors.



**Watch Video Solution**

**41.** Name the enzyme used to dissolve bacterial cell wall.



**Watch Video Solution**

**42.** Explain (a) PCR (b) Bt.



**Watch Video Solution**

**43.** Name the enzyme used to link DNA segments together.



[Watch Video Solution](#)

**44.** What is a vector?



[Watch Video Solution](#)

**45.** What are bioreactors.



[Watch Video Solution](#)

**46.** Can you recall meiosis and indicate at what stage a recombinant DNA is made?



**Watch Video Solution**

**47.** What are hybridomas



**Watch Video Solution**

**48.** Define Pallindromes.



**Watch Video Solution**

**49.** Name the technique used to separate DNA fragments.



**Watch Video Solution**

**50.** Name the enzyme which helps in linking the fragments of DNA with vector.



**Watch Video Solution**

**51.** Expand EFB.



**Watch Video Solution**

**52.** Name the bacterium which acts as natural genetic engineer.



**Watch Video Solution**

**53.** Write down the two core techniques that enabled birth of modern biotechnology.



**Watch Video Solution**

**54.** What is genetic engineering?



**Watch Video Solution**

**55.** List three important features necessary for preparing genetically modifying organism.



**Watch Video Solution**



**56.** Make a list of tools of recombinant DNA technology.



**Watch Video Solution**

**57.** What is genetic engineering? Explain briefly the distinct steps common to all genetic engineering technology.



**Watch Video Solution**

**58.** What does EcoRI signify? How its name is derived?



**Watch Video Solution**

**59.** How does restriction endonuclease work?



**Watch Video Solution**

**60.** What are molecular scissors. Explain their role.



[Watch Video Solution](#)

**61.** Give the source of restriction enzyme, Bam HI and Kpn I.



[Watch Video Solution](#)

**62.** Write a note on recognition sequences or restriction sites.



[Watch Video Solution](#)

**63.** How are restriction endonucleases named?



**Watch Video Solution**

**64.** What is  $t_1$  plasmid? Name the organism where it is found? How does it help in genetic engineering?



**Watch Video Solution**

**65.** Why is *Agrobacterium tumefaciens* is a good cloning vector? Explain.



**Watch Video Solution**

**66.** Name the technique used for separation of DNA fragmetns. What is its principle? How are they observed?



**Watch Video Solution**

**67.** How is DNA isolated in purified form ?



**Watch Video Solution**

**68.** Define vector. Give the properties of Good Vector.



**Watch Video Solution**

**69.** What is the difference between cloning and expression vectors?



**Watch Video Solution**

**70.** Write a note on vectors used during recombinant DNA technology.



**Watch Video Solution**

**71.** What do you understand by the term selectable marker?



**Watch Video Solution**

**72.** Write the major steps involved in gene cloning.



**Watch Video Solution**

**73.** Define Linkers.



**Watch Video Solution**

**74.** What is PCR? List the three main steps .Show the steps with a diagrammatic sketch.







[Watch Video Solution](#)

**75.** Give the applications of PCR technology.



[Watch Video Solution](#)

**76.** Name the various cloning vectors and explain how a plasmid can be used for genetic engineering.



[Watch Video Solution](#)

77. How is recombinant DNA transferred to host?



[Watch Video Solution](#)

78. Differentiate gene therapy and gene cloning.



[Watch Video Solution](#)

79. Describe importance of cloning site in a vector. Illustrate with an example.



[Watch Video Solution](#)

**80.** Name the components of bioreactors.



**Watch Video Solution**

**81.** What are recombinant proteins? How do bioreactors help in their production? Name two recombinant proteins used in therapeutics?



**Watch Video Solution**

**82.** What is the system to multiply the cells harbouring cloned genes?



**Watch Video Solution**

**83.** List the steps in the formation of rDNA.



**Watch Video Solution**

**84.** With the help of simple sketch show the action of restriction enzyme.





[Watch Video Solution](#)

**85.** How is isolation and Fragmentation of DNA of interest carried out in recombinant DNA technology?



[Watch Video Solution](#)

**86.** How is isolated gene of interest amplified?



[Watch Video Solution](#)

**87.** Briefly explain transfer of rDNA into the host.



**Watch Video Solution**

**88.** Name any two cloning vectors. Describe the features required to facilitate cloning into a vector.



**Watch Video Solution**

**89.** What are bioreactors? Sketch the two types of bioreactors. What is the utility? Which is the common type of bioreactors?



**Watch Video Solution**

**90.** How do bioreactors help in production of recombinant proteins?



**Watch Video Solution**

**91.** What advantages do stirred tank bioreactors have over shaken flasks?



**Watch Video Solution**

**92.** Write a not on cloning vector.



**Watch Video Solution**

**93.** What are the proposed benefits of genetic engineering in crpo improvement?





**Watch Video Solution**

**94.** List the distinct steps common to all genetic engineering technology.



**Watch Video Solution**

**95.** List the tools of genetic engineering .



**Watch Video Solution**

**96.** Write the major steps involved in gene cloning.



**Watch Video Solution**

**97.** What are the basic requirements of PCR technique?



**Watch Video Solution**

**98.** Explain microinjection method of introducing alien DNA into the host cell.



**Watch Video Solution**

**99.** Explain gene gun method of introducing alien DNA into the host cell.



**Watch Video Solution**

**100.** Write briefly about any three enzymes needed for rDNA technology.



**Watch Video Solution**

**101.** Which is the most competent host of rDNA technology and why?



**Watch Video Solution**

**102.** Distinguish between YAC and BAC vectors.



[Watch Video Solution](#)

## Exercise

1. Fill in the blanks with suitable words:

One can ligate a foreign DNA at Bam HI site of tetracycline resistance gene in the vector .....



[Watch Video Solution](#)

**2.** Fill in the blanks with suitable words:

Since DNA is a ..... molecule, it cannot pass through cell membranes.



**Watch Video Solution**

**3.** Fill in the blanks with suitable words:

Plasmids and phages are the ..... which are used for cloning purposes in prokaryotes.



**Watch Video Solution**

4. Fill in the blanks with suitable words:

The plasmid vector is isolated from bacterial cell and cleaved at one side by restriction..... .



[Watch Video Solution](#)

5. Fill in the blanks with suitable words:

Recombinant DNA technology is also popularly called as genetic ..... .



[Watch Video Solution](#)

**6. State true or false:**

Exonucleases remove nucleotides at specific positions within DNA.



**Watch Video Solution**

**7. State true or false:**

Discovery of enzyme Eco R1 led to award of Nobel Prizes to W.Arber, H.Smith and D.Nathans in 1978.



**Watch Video Solution**



**8.** State true or false:

Plasmids are the most widely used cloning vectors in the technique of gene manipulation in bacteria.



**Watch Video Solution**

**9.** State true or false:

Bacteriophages are insects that infect animal cells by injecting their DNA into these cells.



**Watch Video Solution**

**10. State true or false:**

Cosmids has been constructed by combining certain features of plasmid and 'cos' sites of phage lambda.



**Watch Video Solution**

**11. State true or false:**

E.coli is a gram negative bacterium and is easy to hadle and grow.



[Watch Video Solution](#)

**12.** Coin one word for the following statements:

The plasmid DNA containing foreign DNA.



[Watch Video Solution](#)

**13.** Coin one word for the following statements:

It is the technique to obtain clones of identical copies of a particular DNA molecule.



[Watch Video Solution](#)

**14.** Coin one word for the following statements:

Any organism containing a foreign gene segment of DNA from a different species.



[Watch Video Solution](#)

**15.** Coin one word for the following statements:

Vectors carrying recombinant DNA(r-DNA) divide and help in producing several clones.



[Watch Video Solution](#)

**16.** Coin one word for the following statements:

Ability of somatic cell to form complete organism.



[Watch Video Solution](#)

**17.** Coin one word for the following statements:

An enzyme which cuts the specific DNA at the two ends to form the restriction fragment.



**Watch Video Solution**

**18.** Coin one word for the following statements:

A pathogenic bacterium which can transfer

part of plasmid DNA during its infection into host plant.



[Watch Video Solution](#)

**19.** Genetic engineering would not have been possible if which of the following were not known?

A. DNA polymerase

B. RNA synthetase

C. DNA liigase

D. Reverse transcriptase.

**Answer:**



**Watch Video Solution**

**20.** Genetic engineering is possible because

A. Phenomenon of transduction in bacteria

is well understood

B. We can see DNA by electron microscope



C. We can cut DNA at specific sites by  
endonucleases like DNAase I

D. Restriction endonucleases purified from  
bacteria can be used in vitro.

**Answer:**



**Watch Video Solution**

**21. Restriction endonucleases are :**

A. Synthesized by bacteria

B. Present in mamalian cells for

degradation of DNA

C. Used for in vitro DNA synthesis

D. Used in genetic engineering.

**Answer:**



**Watch Video Solution**

**22. Reverse transcriptase is also called**

A. RNA-dependant DNA polymerase

B. DNA-dependant RNA polymerase

C. DNA-dependant DNA polymerase

D. RNA-dependant RNA polymerase.

**Answer:**



**Watch Video Solution**

**23.** Structure invovled in genetic engineeing is

:

A. Plasmid

B. Codon

C. Plastid

D. Scissors.

**Answer:**



**Watch Video Solution**

**24.** Which enzyme is useful in genetic engineering ?

A. DNAase

B. Amylase

C. Lipase

D. Restriction endonuclease.

**Answer:**



**Watch Video Solution**

**25. Bacteriophage is**

A. Mycoplasma

B. Virus

C. Bacterium

D. Cyanobacterium.

**Answer:**



**Watch Video Solution**

**26.** Restriction endonucleases are used in genetic engineering because :

A. They can degrade harmful proteins

B. They can join DNA fragments

C. They can cut DNA at specific base sequences

D. They can cut DNA at variable sites.

**Answer:**



**Watch Video Solution**