



# BIOLOGY

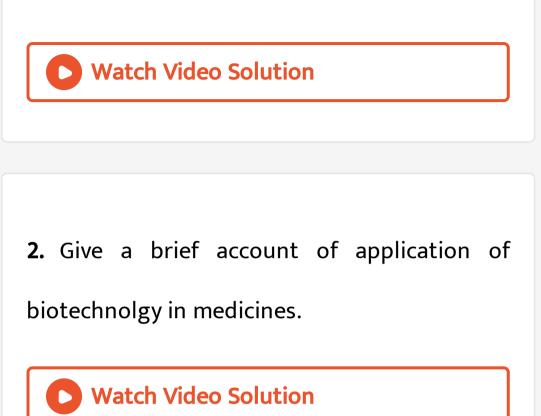
# **BOOKS - MBD -HARYANA BOARD**

# PRINCIPLES AND PROCESSES IN BIOTECHNOLOGY



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

are used as therepeutics(Use the internet).



**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.



4. Whatever you have learnt from classXI ,can

you tell whether enzymes are bigger or DNA is

bigger in molecular size ?

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



# **6.** Do eukaryotic cells have restriction endonucleases?



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



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



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

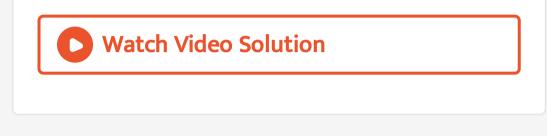


**10.** Describe briefly the following:

Origin of replication

**11.** Describe briefly the following:

Downsream processing



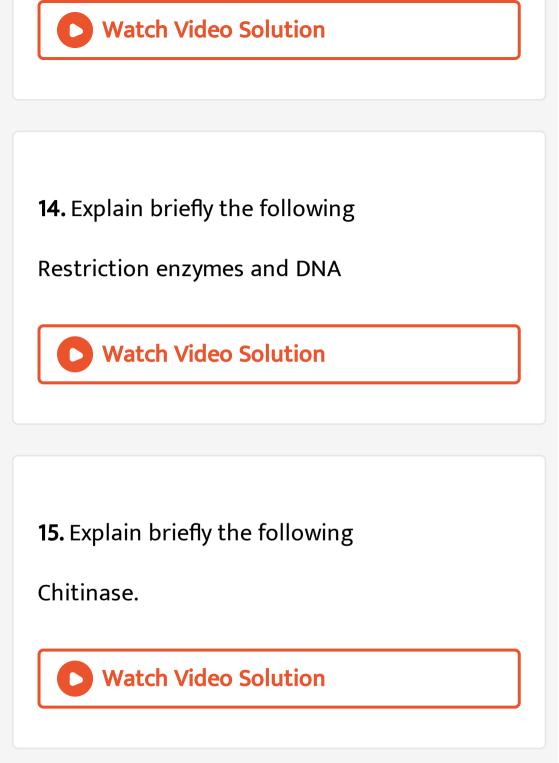
**12.** Describe briefly the following:

bioreactor

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13. Explain briefly the following

PCR



16. Discuss with your teacher an dfind out how

to distinguish betwen

Plasmid DNA and chromosomal DNA



17. Discuss with your teacher an dfind out how

to distinguish betwen

**RNA and DNA** 

18. Discuss with your teacher an dfind out how

to distinguish betwen

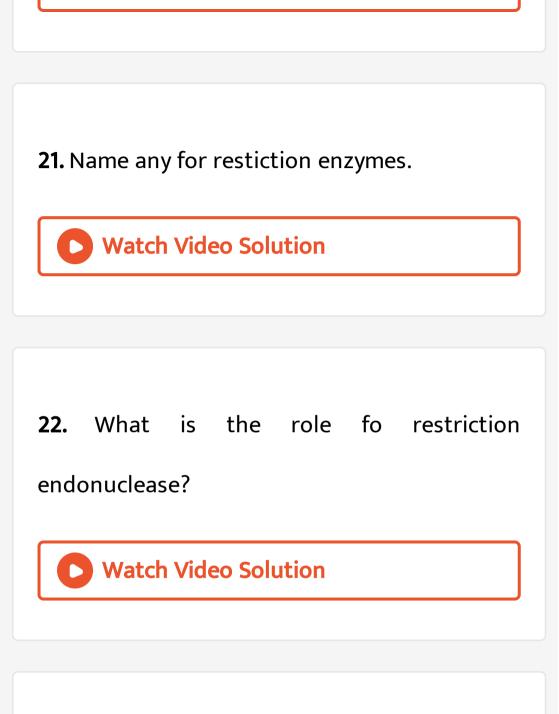
Exonuclease and Endonuclease.

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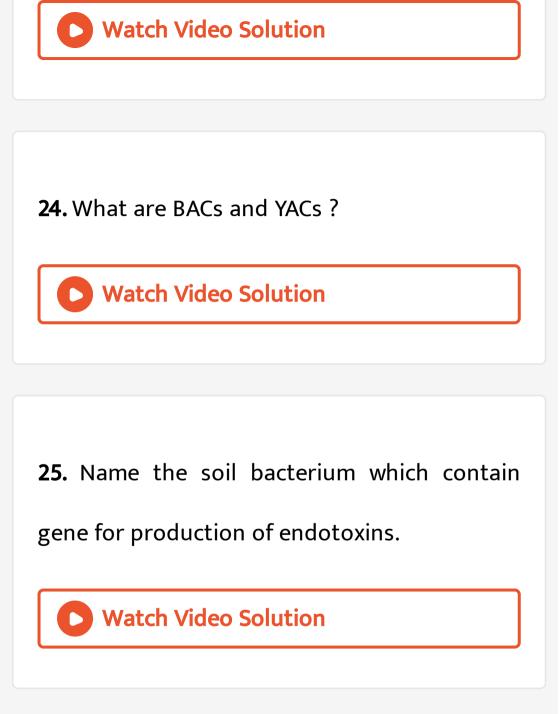
**19.** What is genetic engineering?

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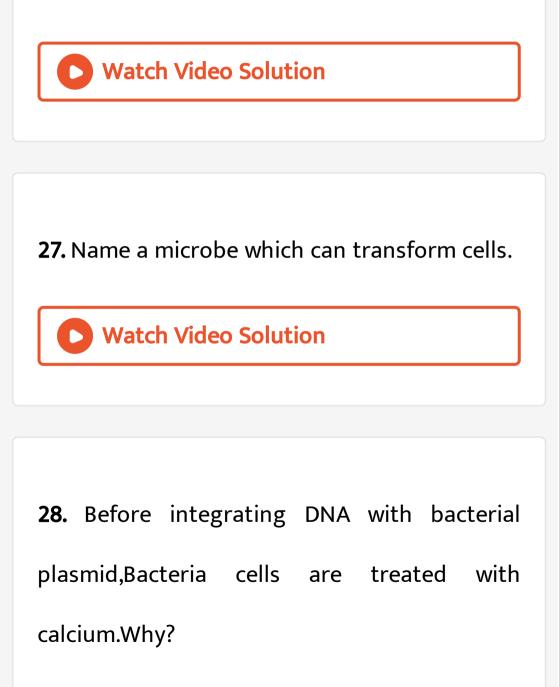
20. Define reecombinat DNA.



23. Define plasmid.



26. How elution of DNA is done?





#### 29. Give an example in which recombinant DNA

technology has provided broad range tools in

diagnosis of diseases.



### 30. Name different E.coli plasmids that are

used as vectors.



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



#### 32. What is the source of DNA polmerase

i.e.,Taq polymerase?

33. Name the DNA polymerase which is usually

bused for PCR.

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

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



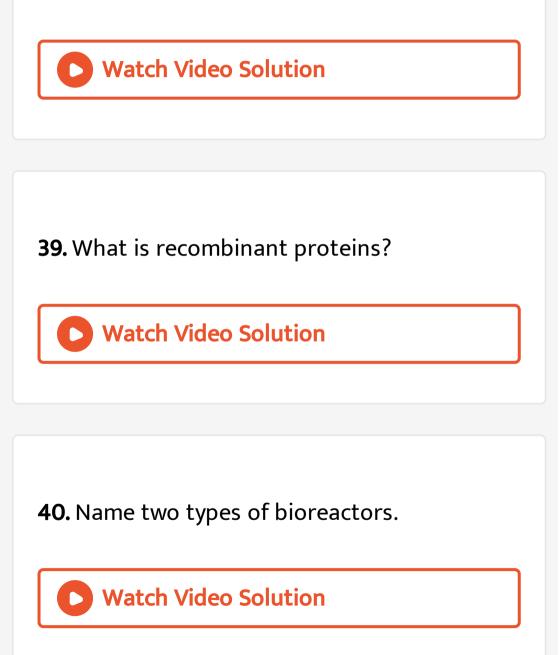
### 36. What can be the source of themostable

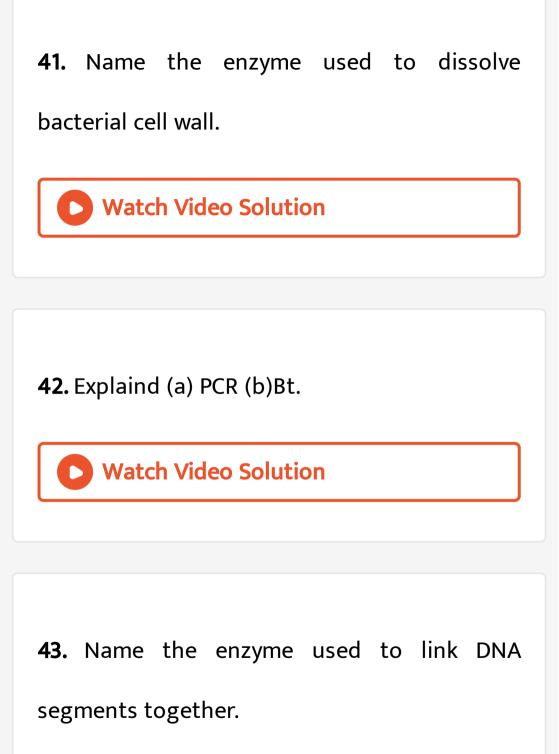
DNA?

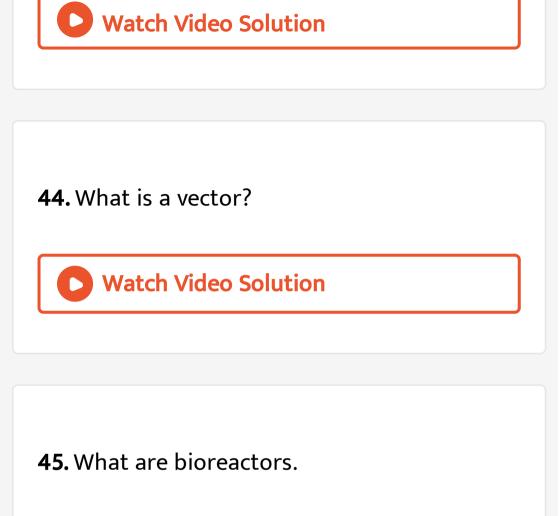
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#### **37.** Name two enzymes involved in PCR.

**38.** What are selectable markers?



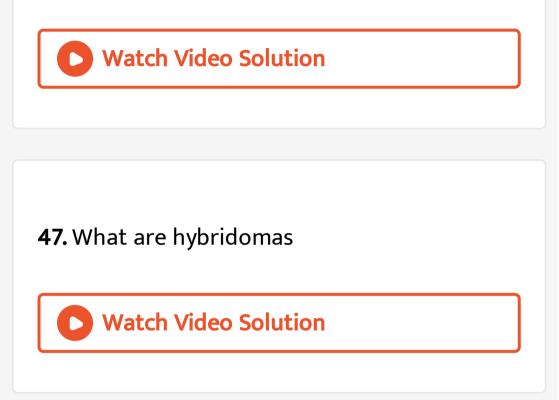






46. Can you recall meiosis and indicate at what

stage a recombinant DNA is made?



48. Define Pallindromes.

49. Name the technique used to separate DNA

fragmetns.

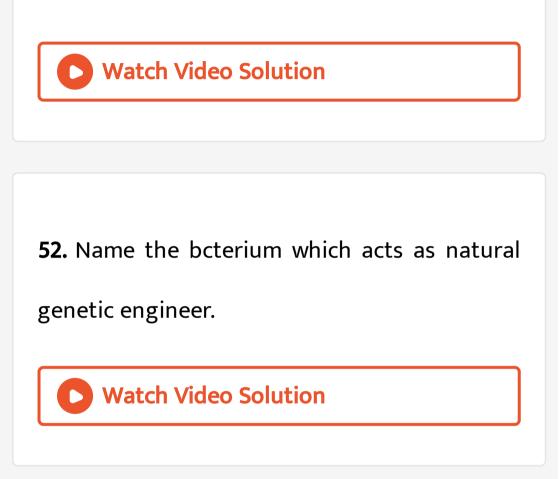


50. Name the enzyme which helps in linking

the fragmetns of DNA with vector.

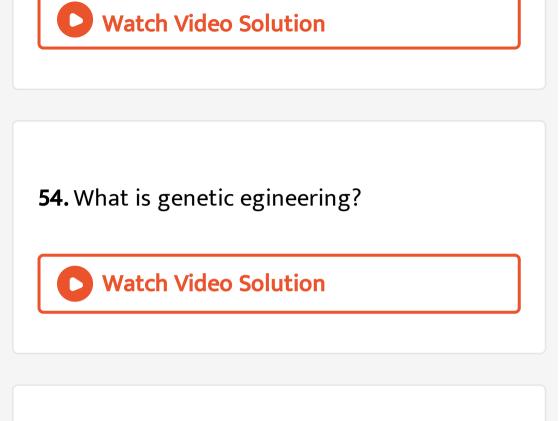


#### **51.** Expand EFB.



53. Write down the two core techniques that

enabled birth of modern biotechnology.



#### 55. List three important features neccessary

for preparing genetically jmodiying organism.



56. Make a list of tools of recombinant DNA

technology.

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

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 sceissors. Explain their

role.



HI and Kpn I.

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62. Write a note on recognition sequences or

restriction sites.



63. How are restriction endomucleasure

enzyes are named?



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

65. Why is Agrobacterium tumefaciens is a

good cloning vector?Explain.

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66. Name the technique used for separation of

DNA fragmetns.What is its principle?How are

they observed?

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



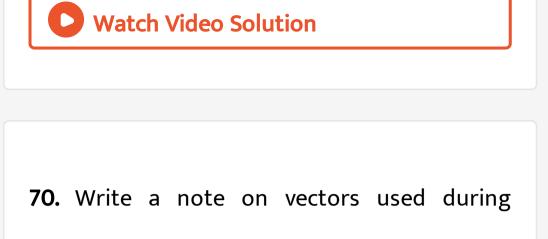
#### 68. Define vector. Give the properties of Good

Vector.

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69. What is the difference between cloning

and expression vectors?



recombinant DNA technology.

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71. What do you understand by the term

selectable marker?

72. Write the major steps involved in gene

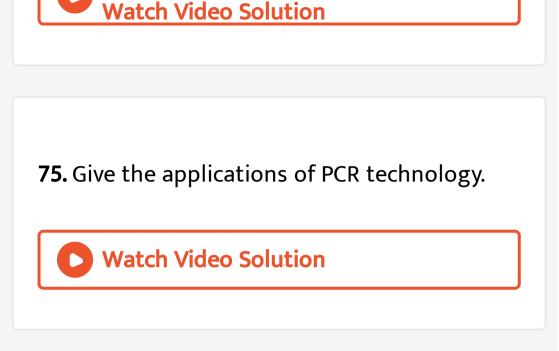
cloning.

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<b>73.</b> Define Linkers.	
<b>Watch Video Solution</b>	

74. What is PCR? List the three main steps

.Show the steps with a diagrammatic sketch.

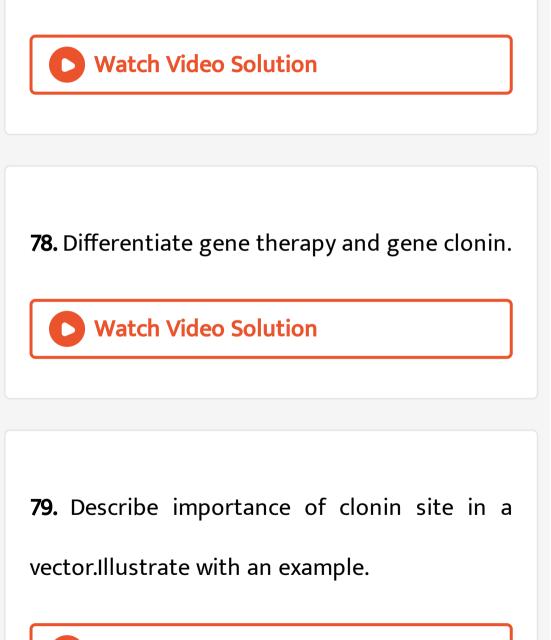




**76.** Name the various cloning vectors and explain how a plasmid can be used for genetic engineering.

77. How is recombinant DNA transferred to

host?



80. Name the components of bioreactors.

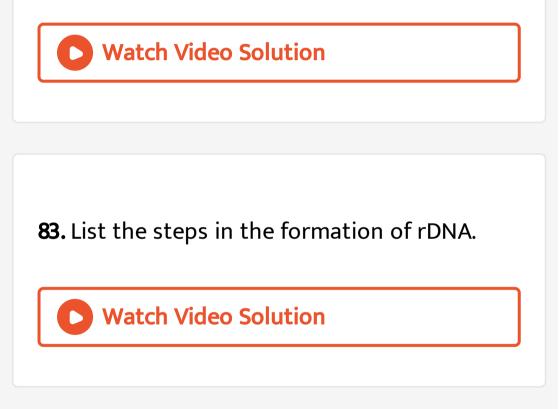
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**81.** What are recombinant proteins?How do bioreactors help in their production?Name two recombinant proteins used in therapentics?



82. What is the system to multiply the cells

harbouring cloned genes?



84. With the help of simple sketch show the

action of restiriction enzyme.





**85.** How is isolation and Fragmentation of DNA of interset carried out in recombinant DNA

technology?

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86. How is isolated gene of inrterest amplified?

87. Briefly explain transfer of rDNA into the

host.



88. Name any two cloning vectors. Describe

the features required to facilitate cloning into

a vector.

89. What are bioreactors?Sketch the two types

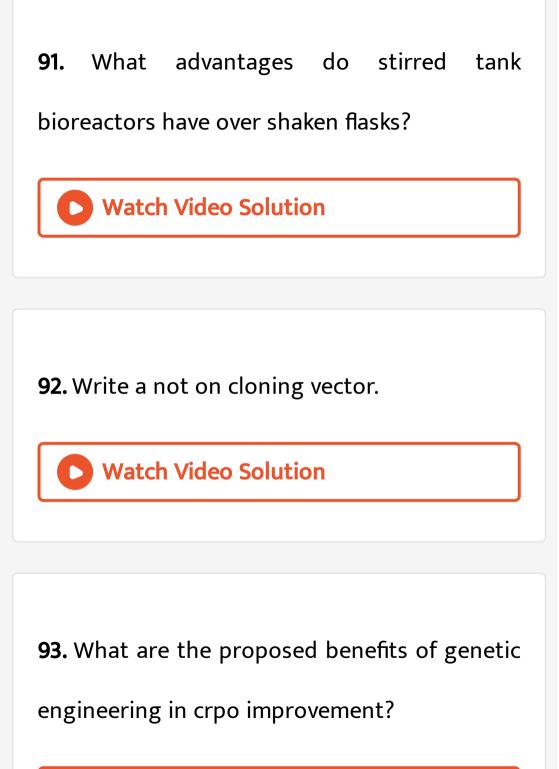
of bioreactors.What is the utility?Which is the

common type of bioreators?



## 90. How do bioreactors help in production of

recombinant proteins?





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

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95. List the tools of gentic engineering .

96. Write the major steps involved in gene cloning.Watch Video Solution

97. What are the basic requirements of PCR

technique?



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



100. Write briefly about any three enzymes

needed for rDNA echonology.

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101. Which is the most competent host of

rDNA technology and why?

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102. Distinguish between YAC and BAC vectors.

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

One can ligate a foreign DNA at Bam HI site of

tetracyline resistace gene in the vector ...........



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

Since DNA is a ..... molecule, it cannot pass

through cell membranes.



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

Plasmids and phages are the ...... which are

used for cloning purposes inprokaryotes.



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

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

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

Recombinnt DNA technology is also popularly

called as genetic ............

**6.** State true or false:

Exonucleases remove nucleotides at specific

positions within DNA.



**7.** State true or false:

Discovery of enzyme Eco R1 let to award of

Nobel Prizes to W.Arber, H.Smith and D.Nathans

in 1978.



**8.** State true or false:

Plasmids are the most widely used cloing

vectors in the technique of gene manipultion

in bacteria.

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**9.** State true or false:

Bacteriophages are insects that infect animal

cells by injecting their DNA into these cells.

**10.** State true or false:

Cosmids has been constructed by combining

certain features of plasmid and 'cos' sites of

phage lambda.



**11.** State true or false:

E.coli is a gram negative bacterium and is easy

to hadle and grow.





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

The plasmid DNA containing foreign DNA.

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

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



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

Any organism containing a foregin gene segent of DNA from a different species.

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

Vectors carrying recombinant DNA(r-DNA)

divide and help in producing several clones.



16. Coin one word for the following statements:Ability of somatic cell to form complete

organism.

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

An enzyme which cuts the specifin DNA at the

two ends to form the restriction fragment.



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

A pathogenic bacterium which can transfer

part of plasmid DNA during its infection into

host plant.



**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:

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## **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

#### indonucleases like DNAase I

D. Restriction endonucleases purified from

bacteria can be useed in vitro.

#### Answer:

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21. Restriction endonucleases are :

A. Synthesized by bacteria

## degradation of DNA

C. Used for in vitro DNA synthesis

D. Used in genetic engineering.

#### **Answer:**

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**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:

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## 23. Structure invovled in genetic engineeing is

A. Plasmid

B. Codon

C. Plastid

D. Scissors.

#### Answer:

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

A. DNAase

B. Amylase

C. Lipase

D. Restriction endonuclease.

#### Answer:

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**25.** Bacteriophage is

A. Mycoplasma

**B.** Virus

C. Bacterium

D. Cyanobacterium.

#### Answer:

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**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: