# **Biotechnology: Principles and Processes**

### Question 1.

Process used for amplification or multiplication of DNA in DNA fingerprinting is

- (a) polymerase chain reaction
- (b) southern blotting
- (c) northern blotting
- (d) none of these.

Answer:

(a) polymerase chain reaction

## Question 2.

Enzyme 'Taq polymerase' used in PCR, has been isolated from bacterium

- (a) Agrobacterium tumefaciens
- (b) Thermus aquaticus
- (c) Streptomyces albus
- (d) Escherichia coli

Answer:

(b) Thermus aquaticus

### Question 3.

Which one of the following is not a correct match?

- (a) Tumour inducing Ti plasmid
- (b) DNA probe Identifies the desired DNA
- (c) PCR DNA staining
- (d) Agarose Seaweeds

Answer:

(c) PCR - DNA staining

#### Question 4.

The correct sequence of different steps of polymerase chain reaction is

- (a) annealing  $\rightarrow$  denaturation  $\rightarrow$  extension
- (b) denaturation  $\rightarrow$  extension  $\rightarrow$  annealing
- (c) denaturation  $\rightarrow$  annealing  $\rightarrow$  extension
- (d) extension  $\rightarrow$  denaturation  $\rightarrow$  annealing.

Answer:

(c) denaturation  $\rightarrow$  annealing  $\rightarrow$  extension

## Question 5.

Which of the following is required to perform polymerase chain reaction?

- (a) Primers, dNTPs and DNA polymerase
- (b) DNA, CaCl<sub>2</sub> and nuclease
- (c) Mg + 2, DNA
- (d) Both (a) and (c)

Answer:

(d) Both (a) and (c)

#### Question 6.

Which of the following is not used to transfer the recombinant DNA into the host?





- (a) Micro-injection method
- (b) Gene gun method
- (c) Bioreactors
- (d) Disarmed pathogen vectors

Answer:

(c) Bioreactors

## Question 7.

A device in which large volume of living cells are cultured in order to get a specific product is called

- (a) PCR
- (b) agitator
- (c) bioreactor
- (d) assimilator.

Answer:

(c) bioreactor

## Question 8.

Rising of dough is due to

- (a) multiplication of yeast
- (b) production of CO<sub>2</sub>
- (c) emulsification
- (d) hydrolysis of wheat flour starch into sugars.

Answer:

(b) production of CO<sub>2</sub>

## Ouestion 9.

An enzyme catalysing the removal of nucleotides from the ends of DNA is

- (a) endonuclease
- (b) exonuclease
- (c) DNA ligase
- (d) Hind II.

Answer:

(b) exonuclease

# Question 10.

The transfer of genetic material from one bacterium to another through the mediation of a vector like virus is termed as

- (a) transduction
- (b) conjugation
- (c) transformation
- (d) translation.

Answer:

(a) transduction

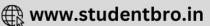
## Question 11.

Who is the father of genetic engineering?

- (a) Steward Linn
- (b) Stanley Cohen
- (c) Paul Berg







(d) Kary Mullis

Answer:

(c) Paul Berg

## Question 12.

Plasmid used to construct the first recombinant DNA was isolated from which bacterium species ?

- (a) Escherichia coli
- (b) Salmonelia typhimurium
- (c) Agrobacterium tumefaciens
- (d) Thermus aquaticus

Answer:

(b) Salmonelia typhimurium

## Ouestion 13.

The term 'molecular scissors' refers to

- (a) recombinant DNA
- (b) restriction enzymes
- (c) Taq polymerase
- (d) palindromic nucleotide sequences.

Answer:

(b) restriction enzymes

### Ouestion 14.

The term 'chemical knife' refers to

- (a) polymerases
- (b) endonucleases
- (c) ribonucleases
- (d) cellulases.

Answer:

(b) endonucleases

## Question 15.

One of the key factors, which makes the plasmid the vector in genetic engineering is

- (a) its resistance to antibiotics
- (b) its resistance to restriction enzymes
- (c) its ability to carry a foreign gene
- (d) its ability to cause infection in the host.

Answer:

(c) its ability to carry a foreign gene

# Question 16.

The term 'recombinant DNA' refers to

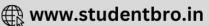
- (a) DNA of the host cell
- (b) DNA with a piece of foreign DNA
- (c) DNA with selectable marker
- (d) DNA with more than one recognition sites.

Answer:

(b) DNA with a piece of foreign DNA







# Question 17.

The term 'chimeric DNA' refers to

- (a) DNA with overhanging stretches
- (b) DNA with palindromic sequence
- (c) a recombinant DNA
- (d) molecular scissors.

Answer:

(c) a recombinant DNA

### Question 18.

Which of the following is not a tool of genetic engineering?

- (a) Cloning vector
- (b) Restriction enzyme
- (c) Foreign DNA
- (d) GMO

Answer:

(d) GMO

## Question 19.

The first restriction endonuclease isolated was

- (a) EcoRI
- (b) BamHI
- (c) Sail
- (d) Hindll

Answer:

(d) Hindll

# Question 20.

The letter 'R' in EcoRI is derived from

- (a) the name of genus
- (b) the name of strain
- (c) the name of species
- (d) the term 'restriction1.

Answer:

(b) the name of strain

## Question 21.

The source of the restriction enzyme HindIII is

- (a) Escherichia coli RY 13
- (b) Haemophilus influenzae Rd
- (c) Bacillus amyloliquefaciens H
- (d) Streptomyces albus.

Answer:

(d) Streptomyces albus.

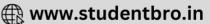
## Question 22.

The sticky ends of a fragmented DNA molecule are made of

- (a) calcium salts
- (b) endonuclease enzyme
- (c) unpaired bases







(d) methyl groups.

Answer:

(c) unpaired bases

### Ouestion 23.

Identify the palindromic sequence in the following.

- (a)
- (b)
- (C)
- (d)

Answer:

(b)

## Question 24.

Which of the following statements is not correct regarding EcoRI restriction endonuclease enzyme?

- (a) It is isolated from Escherichia coli RY 13.
- (b) Its recognition sequence is 5'-GAATTC-3' 3'- CTTAAG-5'.
- (c) It produces complementary blunt ends.
- (d) None of these

Answer:

(c) It produces complementary blunt ends.

### Question 25.

If a plasmid vector is digested with EcoRI at a single site, then

- (a) one sticky end will be produced
- (b) two sticky ends will be produced
- (c) four sticky ends will be produced
- (d) six sticky ends will be produced.

Answer:

(b) two sticky ends will be produced

# Question 26.

Which of the following tools of recombinant DNA technology is incorrectly paired with its use?

- (a) EcoRI Production of sticky ends
- (b) DNA ligase Multiplication of rDNA molecules
- (c) ori copy number
- (d) Selectable marker Identification of transformants

Answer:

(b) DNA ligase - Multiplication of rDNA molecules

# Question 27.

Which one of the following characteristic is generally not preferred for a cloning vector?

- (a) An origin of replication
- (b) An antibiotic resistance marker
- (c) Multiple restriction sites
- (d) A high copy number

Answer:

(c) Multiple restriction sites





Question 28.

Which of the following is not a cloning vector?

- (a) Cosmid
- (b) pBR322
- (c) Sail
- (d) Phagemid

Answer:

(c) Sail

Question 29.

pBR322 was the first artificial cloning vector to be constructed. What does "BR" stands for

- (a) Bacteriophage and Recombinant
- (b) Boliver and Rodriguez
- (c) Boyer and Replicative
- (d) None of these

Answer:

(b) Boliver and Rodriguez

Question 30.

ce gene (tetR) has recognition site for which of the following res

In pBR322, tetracycline resistantriction endonuclease?

- (a) Hind III
- (b) BamHI
- (c) EcoRI
- (d) PstI

Answer:

(d) PstI

Question 31.

Which of the following is not required in the preparation of a recombinant DNA molecule?

- (a) Restriction endonuclease
- (b) DNA ligase
- (c) DNA fragments
- (d) E. coli

Answer:

(d) E. coli

Question 32.

In agarose gel electrophoresis, DNA molecules are separated on the basis of their

- (a) charge only
- (b) size only
- (c) charge to size ratio
- (d) all of the above.

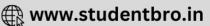
Answer:

(b) size only

Ouestion 33.

While isolating DNA from bacteria, which of the following enzymes is not used?





- (a) Lysozyme
- (b) Ribonuclease
- (c) Deoxyribonuclease
- (d) Protease

Answer:

(c) Deoxyribonuclease

### Ouestion 34.

Which of the following has popularised the PCR (polymerase chain reactions)?

- (a) Easy availability of DNA template
- (b) Availability of synthetic primers
- (c) Availability of cheap deoxyribonucleotides
- (d) Availability of 'thermostable' DNA polymerase

Answer:

(d) Availability of 'thermostable' DNA polymerase

# Question 35.

An antibiotic resistance gene in a vector usually helps in the selection of

- (a) competent cells
- (b) transformed cells
- (c) recombinant cells
- (d) none of the above.

Answer:

(b) transformed cells

## Question 36.

Significance of 'heat shock' method in bacterial transformation is to facilitate

- (a) binding of DNA to the cell wall
- (b) uptake of DNA through membrane transport proteins
- (c) uptake of DNA through transient pores in the bacterial cell wall
- (d) expression of antibiotic resistance gene.

Answer:

(c) uptake of DNA through transient pores in the bacterial cell wall

## Question 37.

Which of the following is not a source of restriction endonuclease?

- (a) Haemophilus influenzae
- (b) Escherichia coli
- (c) Entamoeba coli
- (d) Bacillus amyloliquifaciens

Answer:

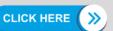
(c) Entamoeba coli

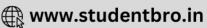
## Ouestion 38.

Which of the following steps are catalysed by Taq polymerase in a PCR reaction?

- (a) Denaturation of template DNA
- (b) Annealing of primers to template DNA
- (c) Extension of primer end on the template DNA
- (d) All of the above







#### Answer:

(c) Extension of primer end on the template DNA

## Question 39.

Who among the following was awarded the Nobel Prize for the development of PCR technique?

- (a) Herbert Boyer
- (b) Hargovind Khurana
- (c) Kary Mullis
- (d) Arthur Komberg

### Answer:

(c) Kary Mullis

## Question 40.

Which of the following statements does not hold true for restriction enzyme?

- (a) It recognises a palindromic nucleotide sequence.
- (b) It is an endonuclease.
- (c) It is isolated from viruses.
- (d) It produces the same kind of sticky ends in different DNA molecules.

#### Answer:

(c) It is isolated from viruses.

## Question 41.

What will be the effect if pBR322, a cloning vector does not carry 'ori' site?

- (a) Sticky ends will not produce
- (b) Transformation will not takes place.
- (c) The cell will transform into a tumour cell.
- (d) Replication will not takes place.

## Answer:

(d) Replication will not takes place.

#### Question 42.

An advantage of using yeasts rather than bacteria as recipient cells for the recombinant DNA of eukaryotes is that yeasts can

- (a) produce restriction enzymes
- (b) excise introns from the RNA transcript
- (c) remove methyl groups
- (d) reproduce more rapidly.

# Answer:

(b) excise introns from the RNA transcript

# Question 43.

Which of the following bacteria is used as a vector for plant genetic engineering?

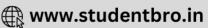
- (a) Agrobacterium tumefacines
- (b) Bacteriophages
- (c) Thermus aquaticus
- (d) Pyrococcus furiosus

### Answer:

(a) Agrobacterium tumefacines







## Question 44.

a crown gall bacterium, is called as 'natural genetic engineer' of plants.

- (a) Escherichia coli
- (b) Streptomyces albus
- (c) Agrobacterium tumefaciens
- (d) Azotobacter

### Answer:

(c) Agrobacterium tumefaciens

## Question 45.

The term "competent" refers to

- (a) increasing the competition between cells
- (b) making cells impermeable for DNA
- (c) Increasing the efficiency with which DNA enters the bacterium through pores in its cell wall
- (d) making cells permeable for divalent cations.

#### Answer:

(c) Increasing the efficiency with which DNA enters the bacterium through pores in its cell wall

## Question 46.

Micro-injection is a method used to

- (a) produce sticky ends of DNA
- (b) provide protection against pathogen
- (c) purify the DNA
- (d) inject recombinant DNA into the nucleus of an animal cell.

#### Answer:

(d) inject recombinant DNA into the nucleus of an animal cell.

## Question 47.

Which of the following is required for micro-injection method of gene transfer?

- (a) Micro-particles
- (b) Micro-pipettes
- (c) Divalent cations
- (d) UV radiations

## Answer:

(b) Micro-pipettes

#### Question 48.

In biolistic method of gene transfer, the microparticles coated with foreign DNA are bombarded into target cells at a very high velocity. These microparticles are made up of

- (a) silver or tungsten
- (b) arsenic or silver
- (c) gold or tungsten
- (d) none of these.

# Answer:

(c) gold or tungsten

#### Ouestion 49.

During isolation of genetic material, the chemical used to precipitate out the purified DNA



is

- (a) bromophenol blue
- (b) Chilled ethanol
- (c) ethidium bromide
- (d) both (a) and (c).

Answer:

(b) Chilled ethanol

Question 50.

The polymerase chain reaction is a technique used for

- (a) amplification of DNA
- (b) amplification of enzymes
- (c) amplification of proteins
- (d) all of these.

Answer:

(a) amplification of DNA

