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 → denaturation → extension
(b) denaturation → extension → annealing
(c) denaturation → annealing → extension
(d) extension → denaturation → annealing.
Answer:
(c) denaturation → annealing → extension

Question 5.
Which of the following is required to perform polymerase chain reaction ?
(a) Primers, dNTPs and DNA polymerase
(b) DNA, $CaCl_2$ 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_2
(c) emulsification
(d) hydrolysis of wheat flour starch into sugars.
Answer:
(b) production of CO_2

Question 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

Question 13.
The term 'molecular scissors' refers to
(a) recombinant DNA
(b) restriction enzymes
(c) Taq polymerase
(d) palindromic nucleotide sequences.
Answer:
(b) restriction enzymes

Question 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 Hindlll 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

Question 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

Question 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

Question 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

Question 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

Question 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