



BIOLOGY

BOOKS - MTG BIOLOGY (ENGLISH)

BIOTECHNOLOGY - PRINCIPLES AND PROCESSES

Mcqs

1. Who is the father of genetic engineering?

- A. Steward Linn
- B. Stanley Cohen
- C. Paul Berg
- D. Kary Mullis

Answer: C



Watch Video Solution



2. Which of the following processes/techniques can be included under biotechnology ?

- (i) In vitro fertilisation
- (ii) Synthesis of a gene
- (iii) Correcting a defective gene
- (iv) Developing a DNA vaccine

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i),(ii),(iii) and (iv)

Answer: D



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

- A. *Escherichia coli*
- B. *Salmonella typhimurium*
- C. *Agrobacterium tumefaciens*
- D. *Thermus aquaticus*

Answer: B



Watch Video Solution

4. Genetic engineering is possible because

- A. We can cut DNA at specific sites by restriction endonucleases
- B. restriction endonucleases purified sites by restriction used in bacteria
- C. the phenomenon of transduction in bacteria is well understood

D. we can see DNA by electron microscope

Answer: A



Watch Video Solution

5. The term 'molecular scissors' refers to

A. recombinant DNA

B. restriction enzymes

C. Taq polymerase

D. polindromic nucleotide sequences.

Answer: B



View Text Solution

6. The term 'chemical knife' refers to

A. polymerases

B. endonucleases

C. ribonucleases

D. cellulases

Answer: B



View Text Solution

7. In recombinant DNA technology, the term vector refers to

A. the enzyme that cuts DNA into restriction fragments

B. the sticky end of a DNA fragment

C. a plasmid used to transfer DNA into a living cell

D. a DNA fragment which carries only ori gene

Answer: C



Watch Video Solution

8. 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



Watch Video Solution

9. 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



Watch Video Solution

10. The term 'chimeric DNA' refers to

- A. DNA with overhanging stretches
- B. DNA with palindromic sequences
- C. a recombinant DNA
- D. molecular scissors

Answer: C



Watch Video Solution

11. Which of the following contains the key tools for recombinant DNA technology?

- (i) Restriction endonucleases, ligases, vectors
- (ii) Ligases, host organism, ligases, vectors
- (iii) Vectors, Taq polymerase, primers
- (iv) Restriction exonucleases, ligases, primers, bioreactors

A. (i), (ii) and (iii)

B. (i) and (ii)

C. (i), (iii) and (iv)

D. (iii) and (iv)

Answer: B



View Text Solution

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

- A. Clonin vector
- B. Restriction enzyme
- C. Foreign DNA
- D. GMO

Answer: D



Watch Video Solution

13. The first restriction endonuclease isolated was

- A. *EcoRI*
- B. Bam-H
- C. Sall
- D. HindII

Answer: D



Watch Video Solution

14. 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 'restriction'

Answer: B



Watch Video Solution

15. Match column I with column II with respect to the nomenclature of restriction enzyme EcoRI and select the correct answer from the given codes.

Column I *Column II*

- | | |
|--------------|--|
| A. <i>E</i> | (i) 1 st in order of identification |
| B. <i>co</i> | (ii) Name of genus |
| C. <i>R</i> | (iii) Name of species |
| D. <i>I</i> | (iv) Name of strain |

(a) $A - (iii), B - (i), C - (ii), D - (iv)$

(b) $A - (ii), B - (i), C - (iii), D - (iv)$

(c) $A - (i), B - (ii), C - (iii), D - (iv)$

(d) $A - (ii), B - (iii), C - (iv), D - (i)$

A. $A - (iii), B - (i), C - (ii), D - (iv)$

B. $A - (ii), B - (i), C - (iii), D - (iv)$

C. $A - (i), B - (ii), C - (iii), D - (iv)$

D. $A - (ii), B - (iii), C - (iv), D - (i)$

Answer: D



Watch Video Solution

16. The source of the restriction enzyme HindII is

A. *Escherichia coli* RY13

B. *Haemophilus influenzae* Rd

C. *Bacillus amyloliquefaciens* H

D. *Streptomyces albus*

Answer: B



Watch Video Solution

17. A restriction endonuclease breaks bonds between the

- A. base pairs of a DNA molecule
- B. base pairs of a *DNA* – *RNA* hybrid molecule
- C. sugar and phosphate components of a nucleic acid molecule
- D. exons and introns of a DNA molecule.

Answer: C



Watch Video Solution

18. Read the given statements and select the correct option,

Statement 1 : Restriction endonuclease enzymes recognise a specific palindromic nucleotide sequence in the DNA

Statement 2: Restriction endonuclease enzymes are called as molecular scissors or biological scissors.

- A. (a) Both statements 1 and 2 are correct
- B. (b) statement 1 is correct but statement 2 is incorrect
- C. (c) statement 1 is incorrect but statement 2 is correct
- D. (d) both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

19. Study the following figures and identify the enzymes involved in steps I and II.



A. EcoRI and DNA Ligase

B. Hind II and DNA Ligase

C. EcoRI and HindII

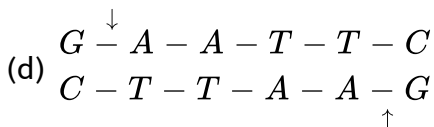
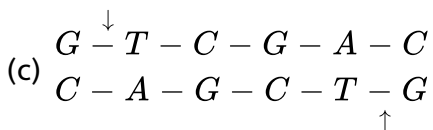
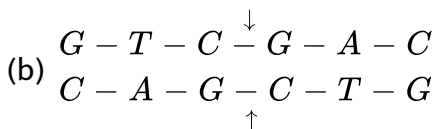
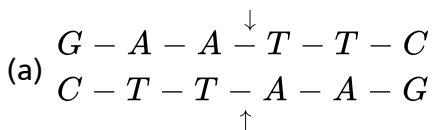
D. Restriction endonuclease and exonuclease

Answer: A



View Text Solution

20. Which of the following correctly depicts the recognition site for EcoRI ?



- A.
$$\begin{array}{ccccccc} G & - & A & - & A & - & T & - & T & - & C \\ C & - & T & - & T & - & A & - & A & - & G \end{array}$$
$$\begin{array}{c} \downarrow \\ \uparrow \end{array}$$
- B.
$$\begin{array}{ccccccc} G & - & T & - & C & - & G & - & A & - & C \\ C & - & A & - & G & - & C & - & T & - & G \end{array}$$
$$\begin{array}{c} \downarrow \\ \uparrow \end{array}$$
- C.
$$\begin{array}{ccccccc} G & - & T & - & C & - & G & - & A & - & C \\ C & - & A & - & G & - & C & - & T & - & G \end{array}$$
$$\begin{array}{c} \downarrow \\ \uparrow \end{array}$$
- D.
$$\begin{array}{ccccccc} G & - & A & - & A & - & T & - & T & - & C \\ C & - & T & - & T & - & A & - & A & - & G \end{array}$$
$$\begin{array}{c} \downarrow \\ \uparrow \end{array}$$

Answer: D



Watch Video Solution

21. The sticky ends of a fragmented DNA molecule are made of

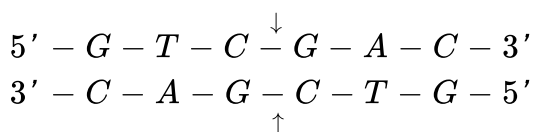
- A. (a) calcium salts
- B. (b) endonuclease enzyme
- C. (c) unpaired bases
- D. (d) methyl groups

Answer: C



Watch Video Solution

22. The restriction enzyme responsible for cleavage of following sequence is



A. (a) EcoRI

B. (b) HindII

C. (c) BamHI

D. (d) EcoRII

Answer: B



Watch Video Solution

23. Identify the palindromic sequence in the following

A. $\frac{GAATTC}{CTTUUG}$

B. $\frac{GGATCC}{CCTAGG}$

C. $\frac{CCTGG}{GGACC}$

D. $\frac{CDATA}{GCTAA}$

Answer: B



Watch Video Solution

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

A. It is isolated from *Escherichia coli* *RY13*

B. Its recognition sequence is $5' - GAATTC - 3'$

$3' - CTTAAG - 5'$

C. It produces complementary blunt ends.

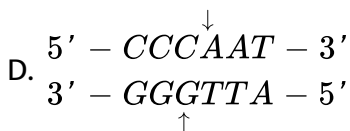
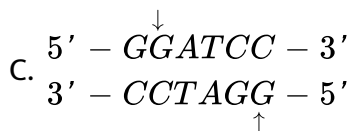
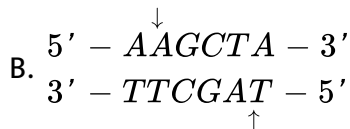
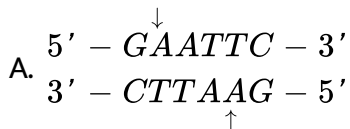
D. None of these

Answer: C



View Text Solution

25. Which of the following sequences is recognised by restriction enzyme BamHI ?



Answer: C



View Text Solution

26. 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



View Text Solution

27. How many fragments will be generated if you digest a linear DNA molecule with a restriction enzyme having four recognition sites on the DNA?

- (a) 3
- (b) 6
- (c) 5
- (d) 4



[Watch Video Solution](#)

28. How many fragments will be generated on the digestion of a closed circular DNA molecule with a restriction enzyme having six recognition sites on the DNA ?

A. 5

B. 7

C. 6

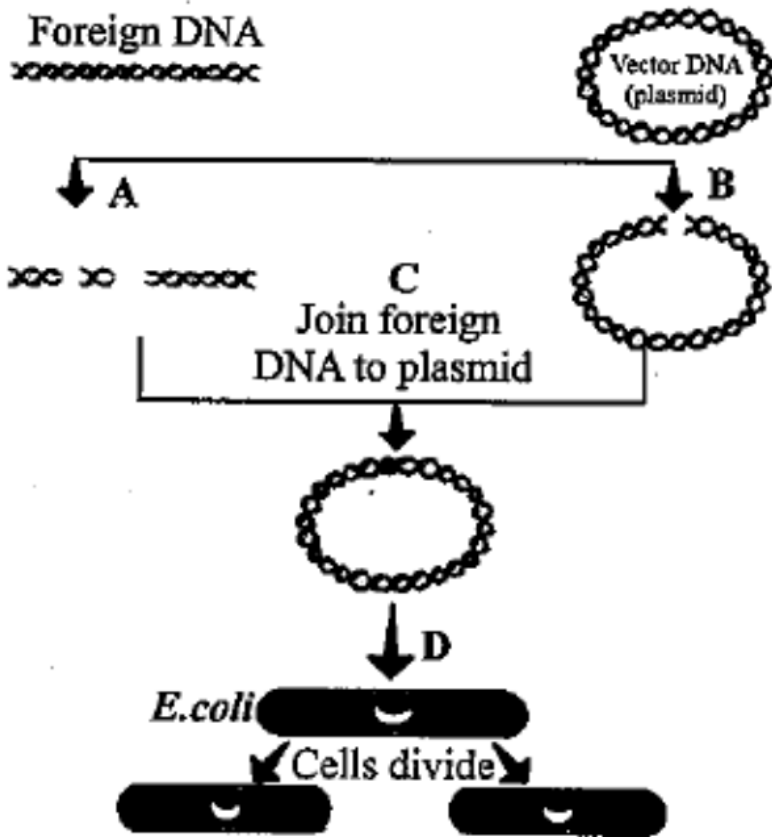
D. 9

Answer: C



[Watch Video Solution](#)

29. The flow chart given below represents the process of recombinant DNA technology. Identify A,B, C and D.



- A. (a) A-Restriction endonuclease, B-Restriction exonuclease, C-DNA ligase, D-Transformation
- B. (b) A-Restriction endonuclease, B-Restriction endonuclease, C-DNA ligase, D-Transformation
- C. (c) A-Restriction endonuclease, B-Restriction endonuclease, C-Hydrolase, D-Transformation

D. (d) A-Restriction endonuclease, B-Restriction endonuclease, C-Hydrolase, D-Transduction

Answer: B



Watch Video Solution

30. In recombinant DNA technology, a plasmid vector is cleaved by

- A. modified DNA ligase
- B. a heated alkaline solution
- C. the same enzyme that cleaves the donor DNA
- D. the different enzyme than that cleaves the donor DNA.

Answer: C



Watch Video Solution

31. Gel electrophoresis is a

- A. technique of separation of charged molecules under the influence of magnetic field
- B. technique of incorporation of DNA molecules into the cell through transient pores made due to electrical impulses
- C. technique of separation of DNA fragments through the pores of agarose gel under the influence of electric field
- D. technique of separation and purification of gene products.

Answer: C



View Text Solution

32. Gel electrophoresis is used for

- A. (a) construction of recombinant DNA using cloning vectors

- B. (b) isolation of DNA molecules
- C. (c) cutting of DNA into fragments
- D. (d) separation of DNA fragments according to their size.

Answer: D



Watch Video Solution

33. Having become an expert on gel electrophoresis, you are asked to examine a gel. Where would you find the smallest segments of DNA?

- (a) Near the positive electrode, farthest away from the wells
- (b) Near the negative electrode, close to the wells
- (c) Near the negative electrode, farther away from the wells
- (d) Near the middle, they tend to slow down after the first few minutes

A. Near the positive electrode, farthest away from the wells

B. Near the negative electrode, close to the wells

C. Near the negative electrode, farther away from the wells

D. Near the middle, they tend to slow down after the first few minutes

Answer: A



Watch Video Solution

34. Which of the following steps performed by person to visualise the DNA bands obtained from gel electrophoresis ?

A. (a) Exposure of DNA fragments to UV radiations

B. (b) Staining gel with bromophenol blue followed by exposure to UV radiations

C. (c) Staining gel with ethidium bromide followed by exposure to UV radiations.

D. (d) Person can see the bands without staining.

Answer: C



View Text Solution

35. Study the given figure carefully and select the incorrect statements regarding this.



- (i) It represents a typical agarose gel electrophoresis in which lane 1 contains undigested DNA
- (ii) Smallest DNA bands are formed at A and largest DNA bands are formed at B
- (iii) The separated DNA fragments can be visualized after staining in the visible light
- (iv) The separated DNA bands are cut out from the agarose gel and extracted from the gel piece. this step is known as elution.

A. (i) and (ii)

B. (ii) and (iii)

C. (ii) and (iv)

D. Person can see the bands without staining.

Answer: B



[View Text Solution](#)

36. 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 DNA molecules
- C. ori- copy number
- D. Selectable marker - Identification of transformants

Answer: B



[View Text Solution](#)

37. If you want to recover many copies of the target DNA, you will choose a vector

- A. Which does not have origin of replication

- B. which has antibiotic resistance gene
- C. whose origin supports high copy number
- D. which has only one restriction site

Answer: C



View Text Solution

38. Which of the following statements are correct ?

- (i) Restriction enzymes cut the strand of DNA a little away from the centre of the palindrome site, but between the same two bases on the opposite strands.
- (ii) Hind II always cuts DNA molecules at a particular point by recognising a specific sequence of six base pairs.
- (iii) Separated DNA fragments cannot be visualised without staining on an agarose gel electrophoresis.
- (iv) 'Ori' is the sequence responsible for controlling the copy number.
- (v) DNA is a positively charged molecule.

- A. (i), (iii) and (v)
- B. (i), (ii),(iii) and (iv)
- C. (iii),(iv) and (v)
- D. (i),(ii),(iii),(iv) and (v)

Answer: B



View Text Solution

39. Which one of the following characteristics 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

- A. An origin of replication
- B. An antibiotic resistance marker

C. Multiple restriction sites

D. A high copy number

Answer: C



Watch Video Solution

40. Read the following statements and select the correct ones.

- (i) Same kind of sticky ends are produced when a DNA has been cut by different restriction enzymes.
- (ii) Exonucleases make cuts at specific positions within the DNA.
- (iii) Hind II was the first restriction endonuclease to be isolated.
- (iv) A bacteriophage has the ability to replicate within bacterial cells by integrating its DNA with bacterial DNA.
- (v) Presence of more than one recognition sites for an enzyme within the vector facilitates the gene cloning.

A. (i),(iii) and (v)

B. (ii) and (iv)

C. (iii) and (iv)

D. (ii),(iii) and (iv)

Answer: C



Watch Video Solution

41. Which of the following is not a cloning vector ?

1) Cosmid

2) pBR 322

3) Sall

4) Phagemid

A. 1) Cosmid

B. 2) pBR 322

C. 3) Sall

D. 4) Phagemid

Answer: C



Watch Video Solution

42. Match column I with column II and select the correct answer from the given codes.

Column I

A. amp^R gene

B. Separation of DNA fragments

C. HindIII

D. $pBR322$

Column II

(i) Artificial plasmid

(ii) Selectable marker

(iii) Electrophoresis

(iv) *Haemophilus influenzae*

A. 1) A – (iii), B – (ii), C – (i), D – (iv)

B. 2) A – (iv), B – (i), C – (iii), D – (ii)

C. 3) A – (ii), B – (iii), C – (iv), D – (i)

D. 4) A – (iii), B – (iv), C – (i), D – (iii)

Answer: C



Watch Video Solution

43. The gene 'rop' present in pBR322 cloning vector, codes for

- 1) the proteins involved in the translation
- 2) the proteins involved in the replication of the plasmid
- 3) the proteins involved in the synthesis of ampicillin only
- 4) the proteins involved in the synthesis of tetracycline only

A. 1) the proteins involved in the translation

B. 2) the proteins involved in the replication of the plasmid

C. 3) the proteins involved in the synthesis of ampicillin only

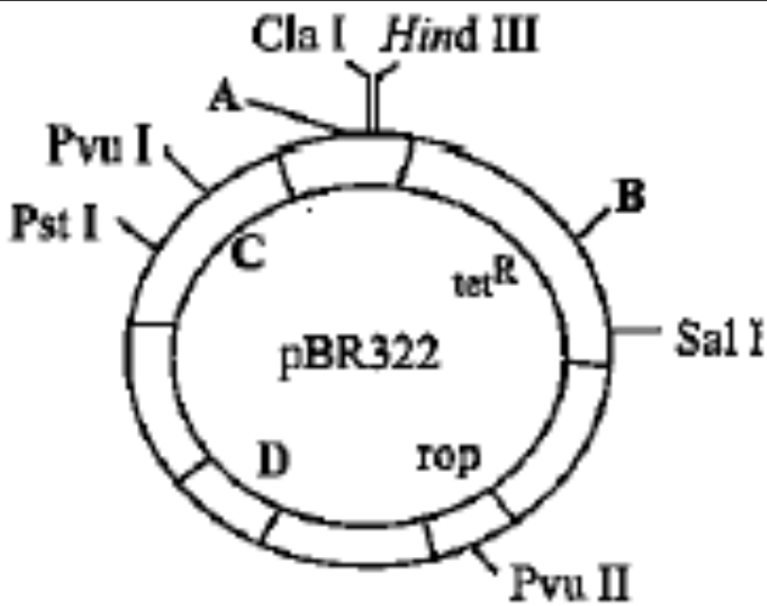
D. 4) the proteins involved in the synthesis of tetracycline only

Answer: B



Watch Video Solution

44. Identify A,B,C, and D in the given figure of E. coli cloning vector pBR322 and select the correct option.



- A.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
HindI	<i>EcoRI</i>	<i>amp^R</i>	ori
- B.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
HindI	<i>BamHI</i>	<i>Kan^R</i>	<i>amp^R</i>
- C.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>BamHI</i>	<i>PstI</i>	ori	<i>amp^R</i>
- D.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>EcoRI</i>	<i>BamHI</i>	<i>amp^R</i>	ori

Answer: D



Watch Video Solution

45. Read the given statements and select the correct option.

Statement 1 : The cloning vector is required to have very few, preferably single, recognition sites for the commonly used restriction enzymes.

Statement 2: Presence of more than one recognition sites within a cloning vector will generate several fragments, which will complicate the process of gene cloning.

- 1) Both statements 1 and 2 are correct
- 2) statement 1 is correct but statement 2 is incorrect
- 3) statement 1 is incorrect but statement 2 is correct
- 4) None of the above

A. 1) Both statements 1 and 2 are correct

B. 2) statement 1 is correct but statement 2 is incorrect

C. 3) statement 1 is incorrect but statement 2 is correct

D.

Answer: A



Watch Video Solution

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

- A. 1) Bacteriophage and Recombinant
- B. 2) Boliver and Rodriguez
- C. 3) Boyer and Replicative
- D. 4) None of these

Answer: B



Watch Video Solution

47. Read the following statements and select the correct ones.

- (i) Electrophoresis is a technique used for the separation of molecules based on their size and charge.
- (ii) Plasmids are extra-chromosomal, self-replicating, usually circular, double stranded DNA molecules found naturally in many bacteria and

also in some yeast,.

(iii) It is not advisable to use an exonuclease enzyme while producing a recombinant DNA molecule.

(iv) In EcoRI, the roman numeral I indicates that it was the first enzyme isolated from E.coli

A) (i) and (ii)

B) (iii) and (iv)

C) (i),(ii) and (iv)

D) (i),(ii),(iii) and (iv)

A. A) (i) and (ii)

B. B) (iii) and (iv)

C. C) (i),(ii) and (iv)

D. D) (i),(ii),(iii) and (iv)

Answer: D



Watch Video Solution

48. In pBR322, tetracycline resistance gene (tet^R) has recognition site for which of the following restriction endonuclease ?

- 1) HindIII
- 2) BamHI
- 3) EcoRI
- 4) PstI

A. 1) HindIII

B. 2) BamHI

C. 3) EcoRI

D. 4) PstI

Answer: B



Watch Video Solution

49. Which of the following is not a characteristic of pBR322 vector ?

- A. 1) It was the first artificial cloning vector constructed in 1977 by Bolivar and Rodriguez.
- B. 2) It is the most widely used, versatile and easily manipulated vector.
- C. 3) It has two antibiotic resistance genes tet^R and amp^R
- D. 4) It does not have restriction site for *Sall*.

Answer: D



Watch Video Solution

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

- A. 1) Sticky ends will not produce
- B. 2) Transformation will not take place
- C. 3) The cell will transform into a tumour cell
- D. 4) Replication will not take place

Answer: D



Watch Video Solution

51. Using recombinant DNA technology, genes from a donor cell can be inserted into a bacterium for DNA replication and protein synthesis. The kind of cells that can be used as gene donors in this technology are

- A. 1) bacteria only
- B. 2) either yeasts or bacteria
- C. 3) eukaryotic cells only
- D. 4) any of these

Answer: D



Watch Video Solution

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

- A. 1) produce restriction enzymes
- B. 2) excise introns from the RNA transcript
- C. 3) remove methyl groups
- D. 4) reproduce more rapidly

Answer: B



Watch Video Solution

53. Read the given statements and select the correct option.

Statement 1: Both bacteria and yeast multiply very fast to form huge populations which express the desired gene.

Statement 2: In recombinant DNA technology, human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryotes).

- A. 1) Both statements 1 and 2 are correct
- B. 2) statement 1 is correct but statement 2 is incorrect
- C. 3) statement 1 is incorrect but statement 2 is correct
- D. 4) Both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

54. In the process of insertional inactivation

- 1) a recombinant DNA is inserted within the coding sequence of enzyme β -galactosidase, resulting in inactivation of the enzyme
- 2) a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid
- 3) a recombinant DNA is inserted within the recognition site for EcoRI
- 4) none of these

- A. 1) a recombinant DNA is inserted within the coding sequence of enzyme β -galactosidase, resulting in inactivation of the enzyme
- B. 2) a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid
- C. 3) a recombinant DNA is inserted within the recognition site for EcoRI
- D. 4) none of these

Answer: A



Watch Video Solution

55. If a person obtains transformants by inserting a recombinant DNA within the coding sequence of enzyme β -galactosidase, he will separate out recombinants from non-recombinants by which of the following observations ?

- A. 1) Non-recombinant colonies do not produce any colour whereas recombينants give blue coloured colonies
- B. 2) Recombينant colonies do not produce any colour whereas non-recombينants given blue coloured colonies.
- C. 3) Recombينants and non-recombينants both produce blue coloured colonies
- D. 4) No colonies are formed due to insertional inactivation

Answer: B



Watch Video Solution

56. Read the given statements and select the correct option

Statement 1 : In insertional inactivation, blue colour produced by bacterial colonies indicates that the plasmid does not have an insert into the bacterial genome.

Statement 2: Presence of insert results into insertional inactivation of β -

galactosidase enzyme and the colonies do not produce any colour.

- A) Both statements 1 and 2 are correct
- B) statement 1 is correct but statement 2 is incorrect
- C) statement 1 is incorrect but statement 2 is correct
- D) Both statements 1 and 2 are incorrect

- A. A) Both statements 1 and 2 are correct
- B. B) statement 1 is correct but statement 2 is incorrect
- C. C) statement 1 is incorrect but statement 2 is correct
- D. D) Both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

57. During insertional inactivation, the presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. The blue colour is produced by the enzyme

- 1) α -glucosidase

2) restriction endonuclease

3) β -galactosidase

4) Taq polymerase

A. 1) α -glucosidase

B. 2) restriction endonuclease

C. 3) β -galactosidase

D. 4) Taq polymerase

Answer: C



Watch Video Solution

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

1) *Agrobacterium tumefaciens*

2) Bacteriophages

3) *Thermus aquaticus*

4) *Pyrococcus furiosus*

A. 1) *Agrobacterium tumefaciens*

B. 2) Bacteriophages

C. 3) *Thermus aquaticus*

D. 4) *Pyrococcus furiosus*

Answer: A



Watch Video Solution

59. Which of the following microbes transform normal plant and animal cells to cancerous cells respectively ?

A. 1) Retroviruses and *Rhizobium*

B. 2) *Escherichia coli* and *Agrobacterium tumefaciens*

C. 3) *Agrobacterium tumefaciens* and Retroviruses

D. 4) *Agrobacterium tumefaciens* and *A. rhizogenes*

Answer: C

60. Read the given statements and select the correct option.

Statement 1 : The tumour inducing plasmid (Tiplasmid) acts as a cloning vector in recombinant DNA technology.

Statement 2: The Ti plasmid which is used in the mechanisms of delivering genes to a cell remains pathogenic.

- A. 1. Both statements 1 and 2 are correct
- B. 2. Statement 1 is correct but statement 2 is incorrect
- C. 3. Statement 1 is incorrect but statement 2 is correct
- D. 4. Both statements 1 and 2 are incorrect

Answer: B

61. _____ a crown gall bacterium, is called an natural genetic engineer' of plants.

- 1) Escherichia coli
- 2) Streptomyces albus
- 3) Agrobacterium tumefaciens
- 4) Azotobacter

A. 1) Escherichia coli

B. 2) Streptomyces albus

C. 3) Agrobacterium tumefaciens

D. 4) Azotobacter

Answer: C



Watch Video Solution

62. DNA cannot pass through a cell membrane as

- 1) it is too big to cross the membrane

- 2) it is a hydrophilic molecule
 - 3) membrane does not have specific proteins to facilitate the transport
 - 4) none of these
-
- A. 1) it is too big to cross the membrane
 - B. 2) it is a hydrophilic molecule
 - C. 3) membrane does not have specific proteins to facilitate the transport
 - D. 4) none of these

Answer: B



Watch Video Solution

63. The term "competent" refers to

- A. 1) increasing the competition between cells
- B. 2) making cells impermeable for DNA

C. 3) increasing the efficiency with which DNA enters the bacterium through pores in its cell wall

D. 4) making cells permeable for divalent cations

Answer: C



Watch Video Solution

64. The correct sequence of making a cell competent is

A. 1. treatment with divalent cation → incubation of cells with recombinant *DNA* of ice → heat shock ($42^{\circ}C$) → placing on ice

B. 2. heat shock ($42^{\circ}C$) → incubation of cells with recombinant DNA on ice → treatment with divalent cations → placing on ice

C. 3. treatment with divalent cation → placing on ice → incubation of cells with recombinant DNA on ice → heat shock ($42^{\circ}C$)

D. 4. incubation of cells with recombinant DNA on ice \rightarrow heat shock

(42°C) \rightarrow treatment with divalent cations \rightarrow placing on ice.

Answer: A



Watch Video Solution

65. Match the terms given in column I with their definitions in column II

and select the correct answer from codes given below.

Column I

Column II

A. Transformation

(i) Sequences cut by restriction enzymes

B. Recognition site

(ii) Process by which DNA fragments are separated

C. Gel electrophoresis

(iii) Plasmid DNA that has incorporated human DNA

D. Recombinant DNA

(iv) Process by which bacteria take up pieces of DNA

A. 1) A – (iii), B – (i), C – (ii), D – (iv)

B. 2) A – (iv), B – (i), C – (ii), D – (iii)

C. 3) A – (i), B – (ii), C – (iii), D – (iv)

D. 4) A – (ii), B – (iii), C – (iv), D – (i)

Answer: B



[Watch Video Solution](#)

66. Micro-injection is a method used to

- A. 1) produce sticky ends of DNA
- B. 2) provide protection against pathogen
- C. 3) purify the DNA
- D. 4) inject recombinant DNA into the nucleus of an animal cell.

Answer: D



[Watch Video Solution](#)

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

- A. 1) micro-particles
- B. 2) Micro-pipettes

C. 3) Divalent cations

D. 4) UV radiations

Answer: B



Watch Video Solution

68. 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

- 1) silver or tungsten
- 2) arsenic or silver
- 3) gold or tungsten
- 4) none of these

A. 1) silver or tungsten

B. 2) arsenic or silver

C. 3) gold or tungsten

D. 4) none of these

Answer: C



Watch Video Solution

69. The different steps of recombinant DNA technology are given below randomly.

- (i) Isolation of the DNA fragments or genes to be cloned
- (ii) Introduction of the recombinant DNA into a suitable cell (usually *E. coli*) called host (transformation)
- (iii) Multiplication/expression of the introduced gene in the host
- (iv) Selection of the transformed host cells, and identification of the clone containing the desired gene/DNA fragment
- (v) Insertion of the isolated gene in a suitable plasmid vector

Which of the following represents the correct sequences of steps ?

A. A) $(i) \rightarrow (iii) \rightarrow (ii) \rightarrow (iv) \rightarrow (v)$

B. B) $(iii) \rightarrow (ii) \rightarrow (i) \rightarrow (v) \rightarrow (iv)$

C. C) $(i) \rightarrow (v) \rightarrow (ii) \rightarrow (iv) \rightarrow (iii)$

D. D) $(v) \rightarrow (i) \rightarrow (iii) \rightarrow (iv) \rightarrow (ii)$

Answer: C



Watch Video Solution

70. The given flow chart depicts the steps to transfer a desirable gene of interest into a plant.



Identify the missing steps (A,B and C) with regard to following statements and select the correct option.

(i) Joining of desirable gene to a suitable cloning vector using ligases to create a recombinant DNA molecule.

(ii) Selection of transformed cells.

(iii) Transferring the recombinant DNA molecules to the target cells.

A. $\begin{matrix} A & B & C \\ (i) & (ii) & (iii). \end{matrix}$

B. $\begin{matrix} A & B & C \\ (i) & (iii) & (ii). \end{matrix}$

- C. $\begin{matrix} A & B & C \\ (ii) & (iii) & (i). \end{matrix}$
- D. $\begin{matrix} A & B & C \\ (iii) & (i) & (ii). \end{matrix}$

Answer: B



Watch Video Solution

71. Fill up the blanks and select the correct option.

(i) EcoRI cuts the DNA between bases_____only when the sequence_____is present in the DNA duplex.

(ii) Disruption of the cell membranes can be achieved by treating the bacterial cells, plant cells and fungal cells with enzymes respectively_____,_____and _____.

(iii) Since DNA has a_____charge, it moves towards the_____of the electrophoretic chamber.

A) (i) G and A, GA A T TC (ii) endonuclease, cellulase, chitinase (ii) negative, anode

B) (i) G and A, G A AT TC (i) lysozyme, cellulase, chitinase (iii) positive, cathode

- C) (i) G and A, GA AT C (ii) lysozyme, cellulase, chitinase (ii) negative, anode
- D) (i) G and A, GA ATC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode
- A. A) (i) G and A, GA A T TC (ii) endonuclease, cellulase, chitinase (ii) negative, anode
- B. B) (i) G and A, G A AT TC (i) lysozyme, cellulase, chitinase (iii) positive, cathode
- C. C) (i) G and A, GA AT C (ii) lysozyme, cellulase, chitinase (ii) negative, anode
- D. D) (i) G and A, GA ATC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode

Answer: C



Watch Video Solution

72. In the isolation of DNA, removal of protein and RNA is carried out by enzymes _____ and _____ respectively.

1) lysozyme, ribonuclease

2) protease, cellulase

3) protease, ribonuclease

4) ribonuclease, chitinase

A. 1) lysozyme, ribonuclease

B. 2) protease, cellulase

C. 3) protease, ribonuclease

D. 4) ribonuclease, chitinase

Answer: C



Watch Video Solution

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

A. a) bromophenol blue

B. b) chilled ethanol

C. c) ethidium bromide

D. d) both (a) and (c)

Answer: B



Watch Video Solution

74. Precipitates of purified DNA after the addition of chilled ethanol are seen as a collection of the fine threads in suspension. This process is referred as

A. 1) DNA transformation

B. 2) DNA ligation

C. 3) DNA spooling

D. 4) DNA duplication

Answer: C



Watch Video Solution

75. Match column I with column II and select the correct answer from the given codes.

Column I

Column II

- | | |
|-------------------------|--------------------------|
| A. Recombinant DNA | (i) Chilled ethanol |
| B. Precipitation of DNA | (ii) DNA staining |
| C. Transposons | (iii) Jumping genes |
| D. Ethidium bromide | (iv) Genetic engineering |

1) A - (iv), B - (i), C - (iii), D - (ii)

2) A - (i), B - (iii), C - (ii), D - (iv)

3) A - (ii), B - (i), C - (iii), D - (iv)

4) A - (iv), B - (ii), C - (i), D - (iii)

A. 1) A - (iv), B - (i), C - (iii), D - (ii)

B. 2) A - (i), B - (iii), C - (ii), D - (iv)

C. 3) A - (ii), B - (i), C - (iii), D - (iv)

D. 4) A - (iv), B - (ii), C - (i), D - (iii)

Answer: A



Watch Video Solution

76. The polymerase chain reaction is a technique used for

- 1) amplification of DNA
- 2) amplification of enzymes
- 3) amplification of proteins
- 4) all of these

- A. 1) amplification of DNA
- B. 2) amplification of enzymes
- C. 3) amplification of proteins
- D. 4) all of these

Answer: A



Watch Video Solution

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

- 1) polymerase chain reaction
- 2) southern blotting
- 3) northern blotting
- 4) None of these

A. 1) polymerase chain reaction

B. 2) southern blotting

C. 3) northern blotting

D. 4) None of these

Answer: A



Watch Video Solution

78. Primers are

- 1) chemically synthesised oligonucleotides that are complementary to the

regions of DNA

2) chemically synthesised oligonucleotides that are not complementary to the regions of DNA

3) chemically synthesised, autonomously replicating circular DNA molecules

4) specific sequences present on recombinant DNA

A. 1) chemically synthesised oligonucleotides that are complementary to the regions of DNA

B. 2) chemically synthesised oligonucleotides that are not complementary to the regions of DNA

C. 3) chemically synthesised, autonomously replicating circular DNA molecules

D. 4) specific sequences present on recombinant DNA

Answer: A



Watch Video Solution

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

- 1) *Agrobacterium tumefaciens*
- 2) *Thermus aquaticus*
- 3) *Streptomyces albus*
- 4) *Escherichia coli*

A. 1) *Agrobacterium tumefaciens*

B. 2) *Thermus aquaticus*

C. 3) *Streptomyces albus*

D. 4) *Escherichia coli*

Answer: B



Watch Video Solution

80. Which of the following statements are correct for the enzyme Taq polymerase ?

- (i) It remains active during the high temperature induced denaturation of dsDNA.
- (ii) It requires primers for carrying out the process of polymerisation.
- (iii) It synthesises the RNA region between the primers, using dNTPs and Mg^{2+} .

- A. a) (i) and (ii)
- B. b) (ii) and (iii)
- C. c) (i),(ii) and (iii)
- D. d) None of these

Answer: A



Watch Video Solution

81. Match column I (enzyme) with column II (characteristic/activity) and select the correct answer from the given codes,

Column I

- A. Taq DNA polymerase
- B. Exonuclease
- C. Protease
- D. Chitinase

Column II

- (i) Cleaves the ends of linear DNA
- (ii) Breakdown of fungal cell wall
- (iii) Stable above $90^{\circ}C$
- (iv) Made only by eukaryotic cells
- (v) Degradation of proteins

1) A - (iii), B - (iv), C - (i), D - (ii)

2) A - (iv), B - (iii), C - (i), D - (ii)

3) A - (ii), B - (i), C - (v), D - (iii)

4) A - (iii), B - (i), C - (v), D - (ii)

A. 1) A - (iii), B - (iv), C - (i), D - (ii)

B. 2) A - (iv), B - (iii), C - (i), D - (ii)

C. 3) A - (ii), B - (i), C - (v), D - (iii)

D. 4) A - (iii), B - (i), C - (v), D - (ii)

Answer: D



Watch Video Solution

82. Which one of the following is not a correct match ?

- A. a) Tumour inducing - Ti plasmid
- B. b) DNA probe - Identifies the desired DNA fragment
- C. c) PCR - DNA staining
- D. d) Agarose - Sea weeds

Answer: C



Watch Video Solution

83. The correct sequence of different steps of polymerease chain reaction is

- 1) annealing → denaturation → extension
- 2) denaturation → extension → annealing
- 3) denaturation → annealing → extension
- 4) extension → denaturation → annealing

A. 1) annealing → denaturation → extension

B. 2) denaturation → extension → annealing

C. 3) denaturation → annealing → extension

D. 4) extension → denaturation → annealing

Answer: C



Watch Video Solution

84. Given table gives an account of differences between PCR and gene cloning. Which of the following points shows the incorrect difference ?

Parameter	<i>PCR</i>	Gene cloning
1. Efficient	More	Less
2. Apparatus Requirement	<i>DNA</i>	Restriction enzyme, ligase, vec
3. Manipulation	in vitro	in vitro and in vivo
4. cost	More	Less
5. Automation	Yes	<i>No</i>
6. Error probability	Less	More
7. Time for a typical experiment	2-4days	<i>4hours</i>
8. Application	More	Less

a) 1 and 3

b) 4,5 and 6

c) 4 and 7

d) 4,7 and 8

A. a) 1 and 3

B. b) 4,5 and 6

C. c) 4 and 7

D. d) 4,7 and 8

Answer: C



Watch Video Solution

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

A. a) Primers, $dNTPs$ and DNA polymerase

B. b) DNA , $CaCl_2$ and nuclease

C. c) Mg^{2+} , DNA

D. d) Both (a) and (c)

Answer: D



Watch Video Solution

86. In a polymerase chain reaction, temperature required for the steps

(i) Denaturation,

(ii) Annealing and

(iii) Extension are respectively

A) (i) 94°C (ii) 40°C (iii) 72°C

B) (i) 40°C (ii) 72°C (iii) 94°C

C) (i) 94°C (ii) 72°C (iii) 40°C

D) (i) 72°C (ii) 94°C (iii) 40°C

A. A) (i) 94°C (ii) 40°C (iii) 72°C

B. B) (i) 40°C (ii) 72°C (iii) 94°C

C. C) (i) 94°C (ii) 72°C (iii) 40°C

D. D) (i) 72°C (ii) 94°C (iii) 40°C

Answer: A



Watch Video Solution

87. In addition to Taq polymerase enzyme which other thermostable DNA polymerases have been isolated to be used in polymerase chain Reaction (*PCR*)?

- A. a) Pfu polymerase isolated from *Pyrococcus furiosus*
- B. b) Tli polymerase(vent ploymerase) isolated from *Thermococcus litoralis*
- C. c) Both (a) and (b)
- D. d) None of these

Answer: C



Watch Video Solution

88. Given figures represents the steps involved in polymerase chain reaction (*PCR*). Identify the steps A,B,C and C and select the correct

option.



A.

A

B

Denaturation at $94 - 96^{\circ}C$ Extension through Taq polymerase at

B.

A

B

C

Denaturation at $94 - 96^{\circ}C$ Annealing at $40 - 60^{\circ}C$ Extension

C.

A

B

C

Denaturation at $40 - 60^{\circ}C$ Annealing at $72^{\circ}C$ Extension through

D.

A

B

Extension through Taq polymerase at $72^{\circ}C$ Denaturation at $40^{\circ}C$

Answer: B



View Text Solution

89. In a polymerase chain reaction after the denaturation step why the mixture needs to cool down to a lower temperature ?

- a) To permit specific annealing of the primers
- b) To give a halt to the reaction mixture
- c) To increase the activity of enzyme Taq polymerase
- d) To obtain the multiple copies of the DNA

- A. a) To permit specific annealing of the primers
- B. b) To give a halt to the reaction mixture
- C. c) To increase the activity of enzyme Taq polymerase
- D. d) To obtain the multiple copies of the DNA

Answer: A



Watch Video Solution

90. If a recombinant DNA bearing gene for resistance to antibiotic ampicillin is transferred to E.coli cells, the host cells become transformed into ampicillin resistant cells. If such bacteria are transferred on agar plates containing ampicillin, only transformants will grown and the untransformed recipient cells will die. The ampicillin resistant gene in this

case is called as

- 1) selectable marker
- 2) recombinant protein
- 3) cloning site
- 4) chemical scalpels

- A. 1) selectable marker
- B. 2) recombinant protein
- C. 3) cloning site
- D. 4) chemical scalpels

Answer: A



Watch Video Solution

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

- A. 1) Micro-injection method

B. 2) Gene gun method

C. 3) Bioreactor

D. 4) Disarmed pathogen vectors

Answer: C



Watch Video Solution

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

1)PCR

2) agitator

3) bioreactor

4) assimilator

A. 1)PCR

B. 2) agitator

C. 3) bioreactor

D. 4) assimilator

Answer: C



Watch Video Solution

93. Which of the following statements are correct with respect to a bioreactor ?

- (i) It can process large volumes of culture.
- (ii) It provides optimum temperature and pH.
- (iii) It is a completely automated tool.
- (iv) It is a compact thermal cyclers.

A. a) (i) and (ii)

B. b) (i),(ii) and (iii)

C. c) (iii) and (iv)

D. d) (ii) and (iii)

Answer: A



Watch Video Solution

94. Identify the figures (A) and (B) and select the correct option.



- A. (A) (B).
Spargal stirred-tank bioreactor Simple stirred-tank bioreactor
- B. (A) (B).
Spargal stirred-tank bioreactor Sparged stirred-tank bioreactor
- C. (A) (B).
Simple stirred-tank Sparged stirred-tank bioreactor
- D. (A) (B).
Simple stirred-tank bioreactor Simple stirred-tank bioreactor

Answer: C



View Text Solution

95. Stirred-tank bioreactors have advantages over shake flasks because they

- A. a) provide high temperature and pH
- B. b) provide better aeration and mixing properties
- C. c) do not allow the entry of CO_2
- D. d) are easy to operate

Answer: B



Watch Video Solution

96. After completion of the biosynthetic stage in the bioreactors, the product undergoes separation and purification processes, collectively termed as

- A. a) transformation
- B. b) electrophoresis
- C. c) downstream processing
- D. d) upstream processing

Answer: C



Watch Video Solution

97. Study the following statements regarding recombinant DNA technology and select the incorrect ones.

- (i) Taq polymerase extends the primers using the nucleotides provided in the reaction.
- (ii) Antibiotic resistance genes are considered as desirable genes in recombinant DNA technology.
- (iii) DNA fragments are separated according to their charge only, in agarose gel electrophoresis.
- (iv) Transformation is a procedure through which a piece of DNA is integrated in to the genome of a host bacterium.
- (v) To produce higher yields of a desired protein, host cells can be multiplied in a continuous culture.
- (vi) Downstream processing is one of the steps of polymerase chain reaction.

A. a) (ii),(iii) and (vi)

B. b) (i),(iii) and (v)

C. c) (ii),(iii) and (v)

D. d) (i),(iv) and (v)

Answer: A



Watch Video Solution

98. Read the following statements and select the incorrect ones.

(i) When the transformed cells on agar plates containing ampicillin are spread, both transformed and untransformed cells will grow.

(ii) Restriction enzymes are used in isolation and separation of DNA from other macromolecules.

(iii) Downstream processing is one of the steps of rDNA technology.

(iv) Disarmed pathogen vectors are also used in transfer of rDNA into the host.

a) (i) and (iii)

b) (iii) and (iv)

c) (i) and (iii)

d) (i) and (ii)

A. a) (i) and (iii)

B. b) (iii) and (iv)

C. c) (i) and (iii)

D. d) (i) and (ii)

Answer: D



Watch Video Solution

99. Match the scientists in column I with their related discoveries in column II and select the correct option from the given codes.

Column I

A. Kary Mullis

B. Paul Berg

C. Stanley Cohen and Herbert Boyer

D. Arber smith and Nathan

Column II

(i) Father of genetic engineering

(ii) Nobel prize for the discovery of

(iii) Developed polymerase chain re

(iv) Isolated an antibiotic resistance

A. 1) $A - (iii), B - (i), C - (iv), D - (ii)$

B. 2) $A - (iii), B - (iv), C - (i), D - (ii)$

C. 3) $A - (iv), B - (ii), C - (iii), D - (i)$

D. 4) $A - (i), B - (iii), C - (iv), D - (ii)$

Answer: A



Watch Video Solution

100. Select the correct option to fill up balnks.

(i) _____ is a natural polymer extracted from_____.

(ii) The DNA fragments purified by gel electrophoresis are used in constructing_____by joining them with_____.

(iii) The ligation of alien DNA is carried out at a_____. present in one of the two_____in a plasmid vector.

(iv)_____enzyme remains active during the high temperature induced denaturation of ds DNA

(v) DNA fragments are resolved according to their_____ through

_____in agarose gel electrophoresis.

a) (i) Agarose, sea weeds (ii) recombinant DNA, cloning vector (iii) restriction site, antibiotic resistance genes (iv) Taq polymerase (v) size, sieving effect

b) (i) Agarose, sea weeds (ii) Restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v) size, sieving effect

c) (i) Agarose, sea weeds (ii) restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerease (v) size, sieving effect

d) (i) size, sieving effect (ii) agarose, seaweeds (iii) recombinant DNA cloning vector (iv) Taq polymerase (v) restriction site, antibiotic resistance genes

A. a) (i) Agarose, sea weeds (ii) recombinant DNA, cloning vector (iii) restriction site, antibiotic resistance genes (iv) Taq polymerase (v) size, sieving effect

B. b) (i) Agarose, sea weeds (ii) Restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v)

size, sieving effect

C. c) (i) Agarose, sea weeds (ii) restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerease (v) size, sieving effect

D. d) (i) size, sieving effect (ii) agarose, eas weeds (iii) recombinant DNA cloning vector (iv) Taq polymerase (v) restriction site, antibiotic resistance genes

Answer: A



Watch Video Solution

Hots

1. Four mutant strians of bacteria (1-4) all require substance S to grow (each strian is blocked at one step in the S-biosynthesis pathway). Four plates were prepared with mininmal medium and a trace of substance, S

to allow a small amount of growth of mutant cells. on plate A, mutant cells of strain 1 were spread over entire surface of the agar to form a thin lawn of bacteria. On plate B, the lawn was composed of mutant cells of strain 2, and so on. On each plate, cells of each of the four mutant types were inoculated over the lawn, as indicated in the figure by the circles. dark circles indicate excellent growth. A strain blocked at a later step in the S substance metabolic pathway accumulates intermediates that can 'feed' a strain blocked at an earlier step.



What is the order of genes (1-4) in the metabolic pathway for synthesis of substance S ?

A. $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$

B. $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C. $1 \rightarrow 3 \rightarrow 4 \rightarrow 2$

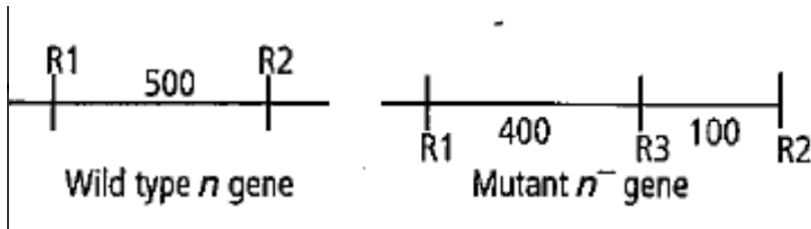
D. $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$

Answer: C



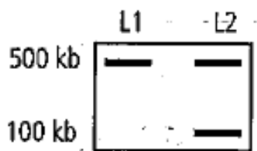
View Text Solution

2. The figure shows the restriction enzyme cutting sites ($R1 - R3$) in wild type (n) and mutant (n^-) gene.

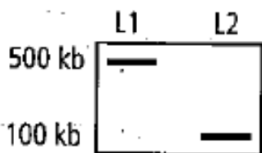


If a radioactively labelled probe (that hybridises at a sequence close to $R1$) is used for detecting the presence of DNA fragments after gel electrophoresis and Southern blotting, which of the following band patterns will you expect ?

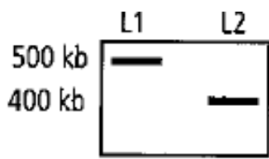
Note : L1 : wild type DNA, L2: mutant DNA



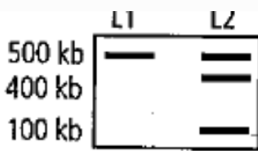
A. (a)



B. (b)



C. (c)



D. (d)

Answer: C



Watch Video Solution

3. Analyse the given diagram which steps involved in the procedure of selecting transformed bacteria.



Identify the bacterial colony which has undergone transformation ?

A. colony 5

B. Colony 2

C. Colony 4

D. Colony 3

Answer: C



View Text Solution

4. The nucleic acid extracted from animal liver is loaded and run on agarose gel. After staining, it shows following pattern :



If the remaining sample is treated with RNase and loaded in gel what result would you expect ?

A. 

B. 

C. 

D. 

Answer: A



View Text Solution

5. The basic procedure involved in the synthesis of recombinant DNA molecule is depicted below. The mistake in the procedure is



- A. Enzyme polymerase is not included.
- B. The mammalian DNA is shown double stranded
- C. Two different restriction enzymes are used.
- D. Only one fragment is inserted

Answer: C



View Text Solution

Ncert

1. Rising of dough is due is

- A. a) multiplication of yeast
- B. b) production of CO_2
- C. c) emulsification
- D. d) hydrolysis of wheat flour starch into sugars.

Answer: B



Watch Video Solution

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

- A. a) endonuclease
- B. b) exonuclease
- C. c) DNA ligase
- D. d) Hind II

Answer: B

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

- A. a) transduction
- B. b) conjugation
- C. c) transformation
- D. d) translation

Answer: A

4. Which of the given statements is correct in the context of observing DNA separated by agarose gel electrophoresis ?

- A. a) DNA can be seen in visible light

- B. b) DNA can be seen without staining in visible light.
- C. c) Ethidium bromide stained DNA can be seen in visible light.
- D. d) Ethidium bromide stained DNA can be seen under exposure to UV light

Answer: D

 [Watch Video Solution](#)

5. Restriction' in restriction enzyme refers to

- A. a) cleaving of phosphodiester bond in DNA by the enzyme
- B. b) cutting of DNA at specific position only
- C. c) prevention of the multiplication of bacteriophage in bacteria
- D. d) all of the above

Answer: C

 [Watch Video Solution](#)

6. 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.coil

Answer: D



Watch Video Solution

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

- A. 1) charge only
- B. 2) size only

C. 3) charge to size ratio

D. 4) all of the above

Answer: B



Watch Video Solution

8. The most important feature in a plasmid to be used as a vector is

A. a) origin of replication (ori)

B. b) presence of a selectable marker

C. c) presence of sites for restriction endonuclease

D. d) its size

Answer: A::B::C::D



Watch Video Solution

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

- A. a) Lysozyme
- B. b) Ribonuclease
- C. c) Deoxyribonuclease
- D. d) Protease

Answer: C



Watch Video Solution

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

- A. a) Easy availability of DNA template
- B. b) Availability of synthetic primers
- C. c) Availability of cheap deoxyribonucleotides

D. d) Availability of 'thermostable' DNA polymerase

Answer: D



Watch Video Solution

11. An antibiotic resistant gene in a vector usually helps in the selection of

A. a) competent cells

B. b) transformed cells

C. c) recombinant cells

D. d) none of the above

Answer: B



Watch Video Solution

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

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

Answer: C



Watch Video Solution

13. The role of DNA ligase in the construction of a recombinant DNA molecule is

- A. a) formation of phosphodiester bond between two DNA fragments
- B. b) formation of hydrogen bonds between sticky ends of DNA fragments

C. c) ligation of all purine and pyrimidine bases

D. d) none of the above

Answer: A



Watch Video Solution

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

(a) Haemophilus influenzae

(b) Escherichia coli

(c) Entamoeba coli

(d) Bacillus amyloliquefaciens

A. Haemophilus influenzae

B. Escherichia coli

C. Entamoeba coli

D. Bacillus amyloliquefaciens

Answer: C



[Watch Video Solution](#)

15. 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 and on the template DNA
- (d) All of the above

- A. Denaturation of template DNA
- B. Annealing of primers to template DNA
- C. Extension of primer and on the template DNA
- D. All of the above

Answer: C



[Watch Video Solution](#)

16. A bacterial cell was transformed with a recombinant DNA that was generated using a human gene. However, the transformed cells did not produce the desired protein. Reason could be

- (a) Human gene may have intron which bacteria cannot process
- (b) Amino acid codons for humans and bacteria are different
- (c) Human protein is formed but degraded by bacteria
- (d) all of the above

A. human gene may have intron which bacteria cannot process

B. amino acid codons for humans and bacteria are different

C. human protein is formed but degraded by bacteria

D. all of the above

Answer: A



Watch Video Solution

17. Which of the following should be chosen for best yield if one were to produce a recombinant protein in large amounts ?

- (a) Laboratory flask of largest capacity
- (b) A stirred-tank bioreactor without in-lets and out-lets
- (c) A continuous culture system
- (d) Any of the above

A. Laboratory flask of largest capacity

B. A stirred-tank bioreactor without in-lets and out-lets

C. A continuous culture system

D. Any of the above

Answer: C



Watch Video Solution

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

- (a) Herbert Boyer
- (b) Hargovind Khurane
- (c) Kary Mullis
- (d) Arthur Kornberg

- A. Herbert Boyer
- B. Hargovind Khurane
- C. Kary Mullis
- D. Athur Kornberg

Answer: C



Watch Video Solution

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

- (a) It recongnises 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

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



Watch Video Solution

Assertion Reason

1. Assertion : In a chemical engineering process, it is necessary to prepare sterile ambience.

Reason : Sterile ambience inhibits the growth of undesirable microbes during manufacture of product like antibiotics, vaccines and enzymes.

- A. a) Both assertion and reason are true and reason is correct explanation of assertion.
- B. b) Both assertion and reason are true but reason is not correct explanation for assertion.
- C. c) Assertion is true but reason is false.
- D. d) Assertion is false but reason is true.

Answer: A



Watch Video Solution

2. Assertion : Asexual reproduction is more important with regard to biotechnology.

Reason : Asexual reproduction preserves the genetic information while sexual reproduction permits variations.

- A. a) Both assertion and reason are true and reason is correct explanation for assertion.

B. b) Both assertion and reason are true but reason is not the correct explanation for assertion.

C. c) Assertion is true but reason is false.

D. d) Assertion is false but reason is true.

Answer: A



Watch Video Solution

3. Assertion : Genetic engineering can overcome the drawbacks of traditional hybridisation.

Reason : Genetic engineering can create desired DNA sequences to meet specific requirements.



Watch Video Solution

4. Assertion : A piece of DNA inserted into an alien organism generally does not replicate if not inserted into a chromosome.

Reason : Chromosomes have specific sequences called ori region where DNA replication is initiated.



[Watch Video Solution](#)

5. Assertion : Genetic engineering requires both nuclease and ligases.

Reason : Ligases produce the nick in the recombinant DNA molecule.



[Watch Video Solution](#)

6. Assertion : Restriction enzymes H_{in}I and H_{pa}I are produced from two different genera of bacteria.

Reason : H_{in}I is produced from Haemophilus while H_{pa}I is produced from Hematococcus.



[Watch Video Solution](#)

7. Assertion : Restriction enzymes recognise palindromic sequences.

Reason : Palindromic sequences read same in both directions of the two strand.

A. d) Both assertion and reason are false.

B.

C.

D.

Answer: B



Watch Video Solution

8. Assertion : The matrix used in gel electrophoresis should have controllable pore size.

Reason : Agarose concentration can be changed to change pore sizes.

- A. a) Both assertion and reason are true and reason is correct explanation for assertion
- B. b) Both assertion and reason are true but reason is not correct explanation of assertion
- C. c) Assertion is true but reason is false.
- D. d) Both assertion and reason are false.

Answer: B



Watch Video Solution

9. Assertion : All expression vectors are cloning vectors and vice versa.

Reason : Expression vectors have at least the regulatory sequences i.e., promotes, operators, ribosomal binding sites, etc having optimum function in the chosen control but not origin of replication.



Watch Video Solution

10. Assertion : E.coli having pBR322 with DNA insert at BamHI site cannot grow in medium containing tetracycline.

Reason : Recognition site for BamHI is present in ter^R region of pBR22.



[Watch Video Solution](#)

11. Assertion : A bacterial cell with restriction enzymes will be easily infected and lysed by bacteriophages.

Reason : Restriction enzymes catalyse synthesis of protective coat around bacterial cell that prevents bacteriophage attack.



[Watch Video Solution](#)

12. Assertion : Special methods are used for transformation i.e., incorporation of recombinant DNA into host.

Reason : DNA is a hydrophilic molecule.



[Watch Video Solution](#)

13. Assertion : Use of chitinase enzyme is necessary for isolation of DNA from yeast cells but not in case of Spirogyra.

Reason : Fungal cell wall is made up of fungal cellulose or chitin.



Watch Video Solution

14. Assertion : PCR primers must not have self complementary regions.

Reason : Self complementary regions result in hairpin structures adversely affecting the PCR.



Watch Video Solution

15. Assertion : Downstream processing is generally considered more difficult and costlier in plants than that in microbes.

Reason : Rhizosecretion is used as a method to facilitate easier recovery of recombinant proteins from plants.



Watch Video Solution

1. Who is the father of genetic engineering?

- A. Steward Linn
- B. Stanley Cohen
- C. Paul Berg
- D. Kary Mullis

Answer: C



Watch Video Solution

2. Which of the following processes/techniques can be included under biotechnology ?

- (i) In vitro fertilisation
- (ii) Synthesis of a gene

(iii) Correcting a defective gene

(iv) Developing a DNA vaccine

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i),(ii),(iii) and (iv)

Answer: D



Watch Video Solution

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

A. *Escherichia coli*

B. *Salmonella typhimurium*

C. *Agrobacterium tumefaciens*

D. *Thermus aquaicus*

Answer: B



Watch Video Solution

4. Genetic engineering is possible because

A. We can cut DNA at specific sites by restriction endonucleases

B. restriction endonucleases purified sites by restriction used in bacteria

C. the phenomenon of transduction in bacteria is well understood

D. we can see DNA by electron microscope

Answer: A



Watch Video Solution

5. The term 'molecular scissors' refers to

- A. recombinant DNA
- B. restriction enzymes
- C. Taq polymerase
- D. polindromic nucleotide sequences.

Answer: B



View Text Solution

6. The term 'chemical knife' refers to

- A. polymerases
- B. endonucleases
- C. ribonucleases
- D. cellulases

Answer: B



View Text Solution

7. In recombinant DNA technology, the term vector refers to

- A. the enzyme that cuts DNA into restriction fragments
- B. the sticky end of a DNA fragment
- C. a plasmid used to transfer DNA into a living cell
- D. a DNA fragment which carries only ori gene

Answer: C



Watch Video Solution

8. 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



Watch Video Solution

9. 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



Watch Video Solution

10. The term 'chimeric DNA' refers to

- A. DNA with overhanging stretches
- B. DNA with palindromic sequences
- C. a recombinant DNA
- D. molecular scissors

Answer: C



Watch Video Solution

11. Which of the following contains the key tools for recombinant DNA technology?

- (i) Restriction endonucleases, ligases, vectors
- (ii) Ligases, host organism, ligases, vectors
- (iii) Vectors, Taq polymerase, primers
- (iv) Restriction exonucleases, ligases, primers, bioreactors

A. (i), (ii) and (iii)

B. (i) and (ii)

C. (i), (iii) and (iv)

D. (iii) and (iv)

Answer: B



View Text Solution

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

A. Clonin vector

B. Restriction enzyme

C. Foreign DNA

D. GMO

Answer: D



Watch Video Solution

13. The first restriction endonuclease isolated was

A. *EcoRI*

B. Bam-H

C. Sall

D. HindII

Answer: D



Watch Video Solution

14. 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 'restriction'

Answer: B



Watch Video Solution

15. Match column I with column II with respect to the nomenclature of restriction enzyme EcoRI and select the correct answer from the given codes.

Column I *Column II*

A. *E* (i) 1st in order of identification

B. *co* (ii) Name of genus

C. *R* (iii) Name of species

D. *l* (iv) Name of strain

(a) A – (iii), B – (i), C – (ii), D – (iv)

(b) A – (ii), B – (i), C – (iii), D – (iv)

(c) A – (i), B – (ii), C – (iii), D – (iv)

(d) A – (ii), B – (iii), C – (iv), D – (i)

A. A – (iii), B – (i), C – (ii), D – (iv)

B. A – (ii), B – (i), C – (iii), D – (iv)

C. $A - (i)$, $B - (ii)$, $C - (iii)$, $D - (iv)$

D. $A - (ii)$, $B - (iii)$, $C - (iv)$, $D - (i)$

Answer: D



Watch Video Solution

16. The source of the restriction enzyme HindII is

A. *Escherichia coli* RY13

B. *Haemophilus influenzae* Rd

C. *Bacillus amyloliquefaciens* H

D. *Streptomyces albus*

Answer: B



Watch Video Solution

17. A restriction endonuclease breaks bonds between the

- A. base pairs of a DNA molecule
- B. base pairs of a *DNA* – *RNA* hybrid molecule
- C. sugar and phosphate components of a nucleic acid molecule
- D. exons and introns of a DNA molecule.

Answer: C



Watch Video Solution

18. Read the given statements and select the correct option,

Statement 1 : Restriction endonuclease enzymes recognise a specific palindromic nucleotide sequence in the DNA

Statement 2: Restriction endonuclease enzymes are called as molecular scissors or biological scissors.

- A. (a) Both statements 1 and 2 are correct

- B. (b) statement 1 is correct but statement 2 is incorrect
- C. (c) statement 1 is incorrect but statement 2 is correct
- D. (d) both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

19. Study the following figures and identify the enzymes involved in steps I and II.

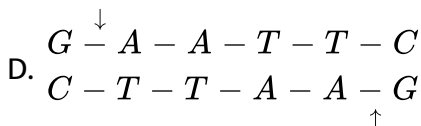
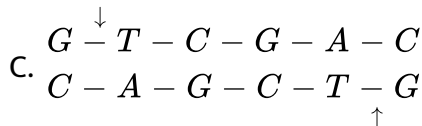
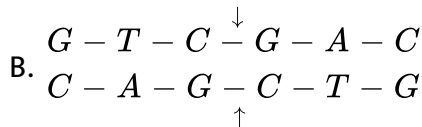
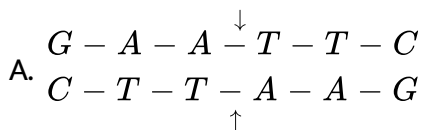
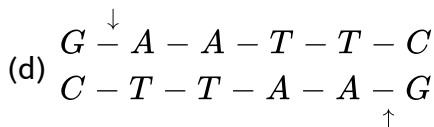
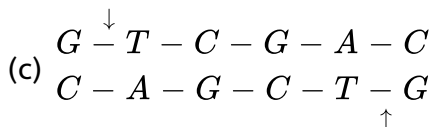
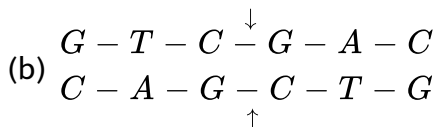
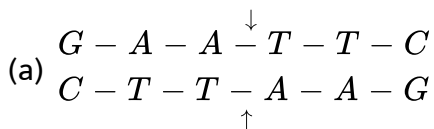


- A. EcoRI and DNA Ligase
- B. Hind II and DNA Ligase
- C. EcoRI and HindII
- D. Restriction endonuclease and exonuclease

Answer: A



20. Which of the following correctly depicts the recognition site for EcoRI ?



Answer: D



Watch Video Solution

21. The sticky ends of a fragmented DNA molecule are made of

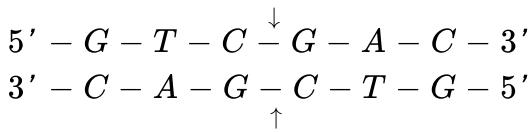
- A. (a) calcium salts
- B. (b) endonuclease enzyme
- C. (c) unpaired bases
- D. (d) methyl groups

Answer: C



Watch Video Solution

22. The restriction enzyme responsible for cleavage of following sequence is



A. (a) EcoRI

B. (b) HindII

C. (c) BamHI

D. (d) EcoRII

Answer: B



Watch Video Solution

23. Identify the palindromic sequence in the following

A. $\frac{GAATTC}{CTTUUG}$

B. $\frac{GGATCC}{CCTAGG}$

C. $\frac{CCTGG}{GGACC}$

D. $\frac{CDATA}{GCTAA}$

Answer: B



Watch Video Solution

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

A. It is isolated from *Escherichia coli* *RY13*

B. Its recognition sequence is $5' - GAATTC - 3'$

$3' - CTTAAG - 5'$

C. It produces complementary blunt ends.

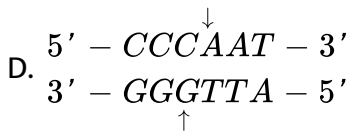
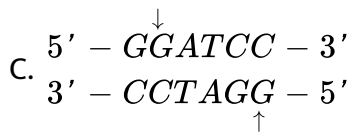
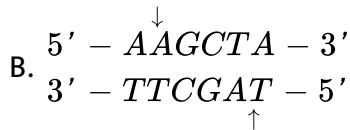
D. None of these

Answer: C



View Text Solution

25. Which of the following sequences is recognised by restriction enzyme BamHI ?



Answer: C



View Text Solution

26. 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



View Text Solution

27. How many fragments will be generated if you digest a linear DNA molecule with a restriction enzyme having four recognition sites on the DNA?

(a) 3

(b) 6

(c) 5

(d) 4



Watch Video Solution

28. How many fragments will be generated on the digestion of a closed circular DNA molecule with a restriction enzyme having six recognition sites on the DNA ?

A. 5

B. 7

C. 6

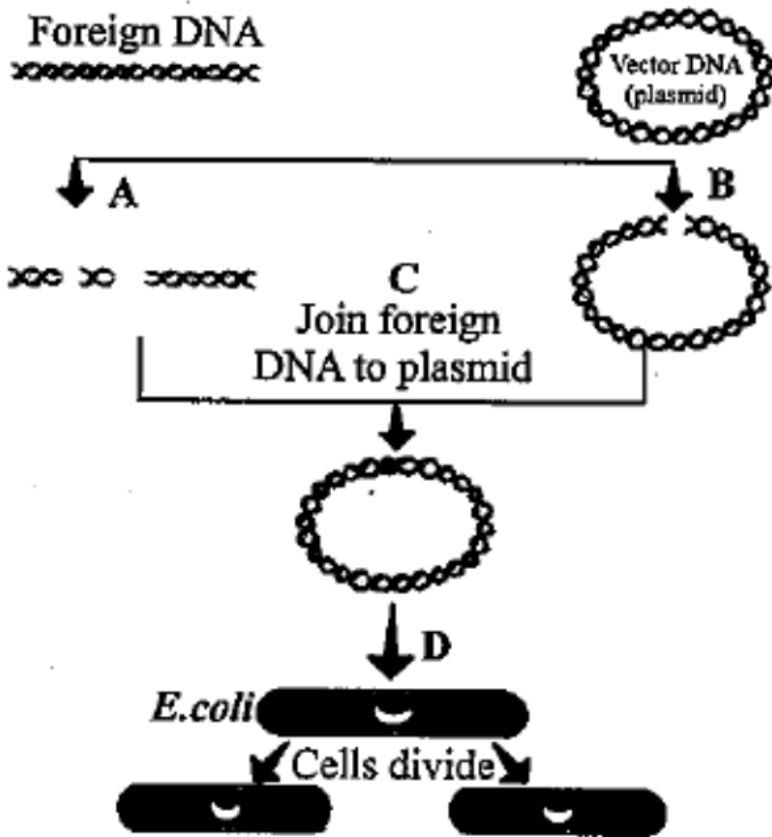
D. 9

Answer: C



Watch Video Solution

29. The flow chart given below represents the process of recombinant DNA technology. Identify A,B, C and D.



- A. (a) A-Restriction endonuclease, B-Restriction exonuclease, C-DNA ligase, D-Transformation
- B. (b) A-Restriction endonuclease, B-Restriction endonuclease, C-DNA ligase, D-Transformation
- C. (c) A-Restriction endonuclease, B-Restriction endonuclease, C-Hydrolase, D-Transformation

D. (d) A-Restriction endonuclease, B-Restriction endonuclease, C-Hydrolase, D-Transduction

Answer: B



Watch Video Solution

30. In recombinant DNA technology, a plasmid vector is cleaved by

- A. modified DNA ligase
- B. a heated alkaline solution
- C. the same enzyme that cleaves the donor DNA
- D. the different enzyme than that cleaves the donor DNA.

Answer: C



Watch Video Solution

31. Gel electrophoresis is a

- A. technique of separation of charged molecules under the influence of magnetic field
- B. technique of incorporation of DNA molecules into the cell through transient pores made due to electrical impulses
- C. technique of separation of DNA fragments through the pores of agarose gel under the influence of electric field
- D. technique of separation and purification of gene products.

Answer: C



View Text Solution

32. Gel electrophoresis is used for

- A. (a) construction of recombinant DNA using cloning vectors

- B. (b) isolation of DNA molecules
- C. (c) cutting of DNA into fragments
- D. (d) separation of DNA fragments according to their size.

Answer: D



Watch Video Solution

33. Having become an expert on gel electrophoresis, you are asked to examine a gel. Where would you find the smallest segments of DNA?

- (a) Near the positive electrode, farthest away from the wells
- (b) Near the negative electrode, close to the wells
- (c) Near the negative electrode, farther away from the wells
- (d) Near the middle, they tend to slow down after the first few minutes

A. Near the positive electrode, farthest away from the wells

B. Near the negative electrode, close to the wells

C. Near the negative electrode, farther away from the wells

D. Near the middle, they tend to slow down after the first few minutes

Answer: A



Watch Video Solution

34. Which of the following steps performed by person to visualise the DNA bands obtained from gel electrophoresis ?

A. (a) Exposure of DNA fragments to UV radiations

B. (b) Staining gel with bromophenol blue followed by exposure to UV radiations

C. (c) Staining gel with ethidium bromide followed by exposure to UV radiations.

D. (d) Person can see the bands without staining.

Answer: C



View Text Solution

35. Study the given figure carefully and select the incorrect statements regarding this.



- (i) It represents a typical agarose gel electrophoresis in which lane 1 contains undigested DNA
- (ii) Smallest DNA bands are formed at A and largest DNA bands are formed at B
- (iii) The separated DNA fragments can be visualized after staining in the visible light
- (iv) The separated DNA bands are cut out from the agarose gel and extracted from the gel piece. this step is known as elution.

A. (i) and (ii)

B. (ii) and (iii)

C. (ii) and (iv)

D. Person can see the bands without staining.

Answer: B



[View Text Solution](#)

36. 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 DNA molecules
- C. ori- copy number
- D. Selectable marker - Identification of transformants

Answer: B



[View Text Solution](#)

37. If you want to recover many copies of the target DNA, you will choose a vector

- A. Which does not have origin of replication

- B. which has antibiotic resistance gene
- C. whose origin supports high copy number
- D. which has only one restriction site

Answer: C



View Text Solution

38. Which of the following statements are correct ?

- (i) Restriction enzymes cut the strand of DNA a little away from the centre of the palindrome site, but between the same two bases on the opposite strands.
- (ii) Hind II always cuts DNA molecules at a particular point by recognising a specific sequence of six base pairs.
- (iii) Separated DNA fragments cannot be visualised without staining on an agarose gel electrophoresis.
- (iv) 'Ori' is the sequence responsible for controlling the copy number.
- (v) DNA is a positively charged molecule.

- A. (i), (iii) and (v)
- B. (i), (ii),(iii) and (iv)
- C. (iii),(iv) and (v)
- D. (i),(ii),(iii),(iv) and (v)

Answer: B



View Text Solution

39. Which one of the following characteristics 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

- A. An origin of replication
- B. An antibiotic resistance marker

C. Multiple restriction sites

D. A high copy number

Answer: C



Watch Video Solution

40. Read the following statements and select the correct ones.

- (i) Same kind of sticky ends are produced when a DNA has been cut by different restriction enzymes.
- (ii) Exonucleases make cuts at specific positions within the DNA.
- (iii) Hind II was the first restriction endonuclease to be isolated.
- (iv) A bacteriophage has the ability to replicate within bacterial cells by integrating its DNA with bacterial DNA.
- (v) Presence of more than one recognition sites for an enzyme within the vector facilitates the gene cloning.

A. (i),(iii) and (v)

B. (ii) and (iv)

C. (iii) and (iv)

D. (ii),(iii) and (iv)

Answer: C



Watch Video Solution

41. Which of the following is not a cloning vector ?

1) Cosmid

2) pBR 322

3) Sall

4) Phagemid

A. 1) Cosmid

B. 2) pBR 322

C. 3) Sall

D. 4) Phagemid

Answer: C



Watch Video Solution

42. Match column I with column II and select the correct answer from the given codes.

Column I

A. amp^R gene

B. Separation of DNA fragments

C. HindIII

D. *pBR322*

Column II

(i) Artificial plasmid

(ii) Selectable marker

(iii) Electrophoresis

(iv) *Haemophilus influenzae*

A. 1) A – (iii), B – (ii), C – (i), D – (iv)

B. 2) A – (iv), B – (i), C – (iii), D – (ii)

C. 3) A – (ii), B – (iii), C – (iv), D – (i)

D. 4) A – (iii), B – (iv), C – (i), D – (iii)

Answer: C



Watch Video Solution

43. The gene 'rop' present in pBR322 cloning vector, codes for

- 1) the proteins involved in the translation
- 2) the proteins involved in the replication of the plasmid
- 3) the proteins involved in the synthesis of ampicillin only
- 4) the proteins involved in the synthesis of tetracycline only

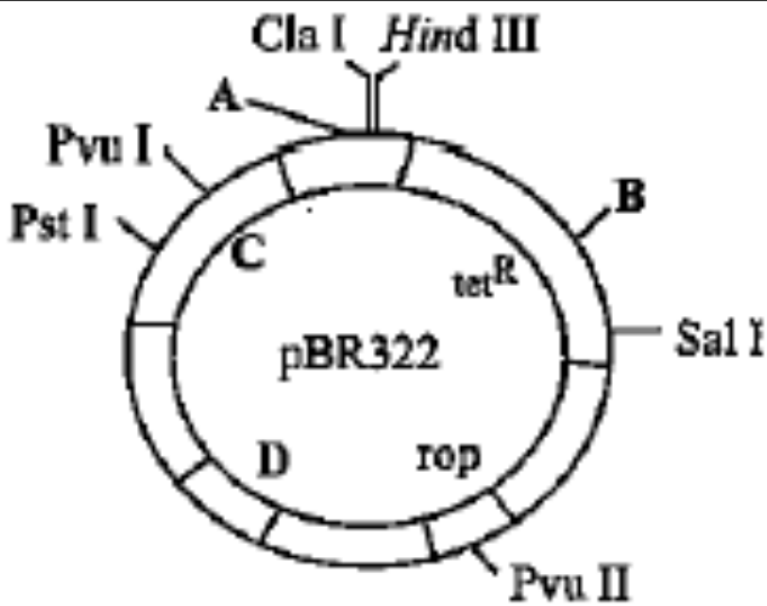
- A. 1) the proteins involved in the translation
- B. 2) the proteins involved in the replication of the plasmid
- C. 3) the proteins involved in the synthesis of ampicillin only
- D. 4) the proteins involved in the synthesis of tetracycline only

Answer: B



Watch Video Solution

44. Identify A,B,C, and D in the given figure of E. coli cloning vector pBR322 and select the correct option.



- A.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
HindI	<i>EcoRI</i>	<i>amp^R</i>	ori
- B.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
HindI	<i>BamHI</i>	<i>Kan^R</i>	<i>amp^R</i>
- C.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>BamHI</i>	<i>PstI</i>	ori	<i>amp^R</i>
- D.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>EcoRI</i>	<i>BamHI</i>	<i>amp^R</i>	ori

Answer: D



Watch Video Solution

45. Read the given statements and select the correct option.

Statement 1 : The cloning vector is required to have very few, preferably single, recognition sites for the commonly used restriction enzymes.

Statement 2: Presence of more than one recognition sites within a cloning vector will generate several fragments, which will complicate the process of gene cloning.

- 1) Both statements 1 and 2 are correct
- 2) statement 1 is correct but statement 2 is incorrect
- 3) statement 1 is incorrect but statement 2 is correct
- 4) None of the above

A. 1) Both statements 1 and 2 are correct

B. 2) statement 1 is correct but statement 2 is incorrect

C. 3) statement 1 is incorrect but statement 2 is correct

D.

Answer: A



Watch Video Solution

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

- A. 1) Bacteriophage and Recombinant
- B. 2) Boliver and Rodriguez
- C. 3) Boyer and Replicative
- D. 4) None of these

Answer: B



Watch Video Solution

47. Read the following statements and select the correct ones.

- (i) Electrophoresis is a technique used for the separation of molecules based on their size and charge.
- (ii) Plasmids are extra-chromosomal, self-replicating, usually circular, double stranded DNA molecules found naturally in many bacteria and

also in some yeast,.

(iii) It is not advisable to use an exonuclease enzyme while producing a recombinant DNA molecule.

(iv) In EcoRI, the roman numeral I indicates that it was the first enzyme isolated from E.coli

A) (i) and (ii)

B) (iii) and (iv)

C) (i),(ii) and (iv)

D) (i),(ii),(iii) and (iv)

A. A) (i) and (ii)

B. B) (iii) and (iv)

C. C) (i),(ii) and (iv)

D. D) (i),(ii),(iii) and (iv)

Answer: D



Watch Video Solution

48. In pBR322, tetracycline resistance gene (tet^R) has recognition site for which of the following restriction endonuclease ?

- 1) HindIII
- 2) BamHI
- 3) EcoRI
- 4) PstI

A. 1) HindIII

B. 2) BamHI

C. 3) EcoRI

D. 4) PstI

Answer: B



Watch Video Solution

49. Which of the following is not a characteristic of pBR322 vector ?

- A. 1) It was the first artificial cloning vector constructed in 1977 by Bolivar and Rodriguez.
- B. 2) It is the most widely used, versatile and easily manipulated vector.
- C. 3) It has two antibiotic resistance genes tet^R and amp^R
- D. 4) It does not have restriction site for *Sall*.

Answer: D



Watch Video Solution

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

- A. 1) Sticky ends will not produce
- B. 2) Transformation will not take place
- C. 3) The cell will transform into a tumour cell
- D. 4) Replication will not take place

Answer: D



Watch Video Solution

51. Using recombinant DNA technology, genes from a donor cell can be inserted into a bacterium for DNA replication and protein synthesis. The kind of cells that can be used as gene donors in this technology are

- A. 1) bacteria only
- B. 2) either yeasts or bacteria
- C. 3) eukaryotic cells only
- D. 4) any of these

Answer: D



Watch Video Solution

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

- A. 1) produce restriction enzymes
- B. 2) excise introns from the RNA transcript
- C. 3) remove methyl groups
- D. 4) reproduce more rapidly

Answer: B



Watch Video Solution

53. Read the given statements and select the correct option.

Statement 1: Both bacteria and yeast multiply very fast to form huge populations which express the desired gene.

Statement 2: In recombinant DNA technology, human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryotes).

- A. 1) Both statements 1 and 2 are correct
- B. 2) statement 1 is correct but statement 2 is incorrect
- C. 3) statement 1 is incorrect but statement 2 is correct
- D. 4) Both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

54. In the process of insertional inactivation

- 1) a recombinant DNA is inserted within the coding sequence of enzyme β -galactosidase, resulting in inactivation of the enzyme
- 2) a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid
- 3) a recombinant DNA is inserted within the recognition site for EcoRI
- 4) none of these

- A. 1) a recombinant DNA is inserted within the coding sequence of enzyme β -galactosidase, resulting in inactivation of the enzyme
- B. 2) a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid
- C. 3) a recombinant DNA is inserted within the recognition site for EcoRI
- D. 4) none of these

Answer: A



Watch Video Solution

55. If a person obtains transformants by inserting a recombinant DNA within the coding sequence of enzyme β -galactosidase, he will separate out recombinants from non-recombinants by which of the following observations ?

- A. 1) Non-recombinant colonies do not produce any colour whereas recombينants give blue coloured colonies
- B. 2) Recombينant colonies do not produce any colour whereas non-recombينants given blue coloured colonies.
- C. 3) Recombينants and non-recombينants both produce blue coloured colonies
- D. 4) No colonies are formed due to insertional inactivation

Answer: B



Watch Video Solution

56. Read the given statements and select the correct option

Statement 1 : In insertional inactivation, blue colour produced by bacterial colonies indicates that the plasmid does not have an insert into the bacterial genome.

Statement 2: Presence of insert results into insertional inactivation of β -

galactosidase enzyme and the colonies do not produce any colour.

- A) Both statements 1 and 2 are correct
- B) statement 1 is correct but statement 2 is incorrect
- C) statement 1 is incorrect but statement 2 is correct
- D) Both statements 1 and 2 are incorrect

- A. A) Both statements 1 and 2 are correct
- B. B) statement 1 is correct but statement 2 is incorrect
- C. C) statement 1 is incorrect but statement 2 is correct
- D. D) Both statements 1 and 2 are incorrect

Answer: A



Watch Video Solution

57. During insertional inactivation, the presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. The blue colour is produced by the enzyme

1) α -glucosidase

2) restriction endonuclease

3) β -galactosidase

4) Taq polymerase

A. 1) α -glucosidase

B. 2) restriction endonuclease

C. 3) β -galactosidase

D. 4) Taq polymerase

Answer: C



Watch Video Solution

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

1) *Agrobacterium tumefaciens*

2) Bacteriophages

3) *Thermus aquaticus*

4) *Pyrococcus furiosus*

A. 1) *Agrobacterium tumefaciens*

B. 2) Bacteriophages

C. 3) *Thermus aquaticus*

D. 4) *Pyrococcus furiosus*

Answer: A



Watch Video Solution

59. Which of the following microbes transform normal plant and animal cells to cancerous cells respectively ?

A. 1) Retroviruses and *Rhizobium*

B. 2) *Escherichia coli* and *Agrobacterium tumefaciens*

C. 3) *Agrobacterium tumefaciens* and Retroviruses

D. 4) *Agrobacterium tumefaciens* and *Agrobacterium rhizogenes*

Answer: C

60. Read the given statements and select the correct option.

Statement 1 : The tumour inducing plasmid (Tiplasmid) acts as a cloning vector in recombinant DNA technology.

Statement 2: The Ti plasmid which is used in the mechanisms of delivering genes to a cell remains pathogenic.

- A. 1. Both statements 1 and 2 are correct
- B. 2. Statement 1 is correct but statement 2 is incorrect
- C. 3. Statement 1 is incorrect but statement 2 is correct
- D. 4. Both statements 1 and 2 are incorrect

Answer: B

61. _____ a crown gall bacterium, is called an natural genetic engineer' of plants.

- 1) Escherichia coli
- 2) Streptomyces albus
- 3) Agrobacterium tumefaciens
- 4) Azotobacter

A. 1) Escherichia coli

B. 2) Streptomyces albus

C. 3) Agrobacterium tumefaciens

D. 4) Azotobacter

Answer: C



Watch Video Solution

62. DNA cannot pass through a cell membrane as

- 1) it is too big to cross the membrane

2) it is a hydrophilic molecule

3) membrane does not have specific proteins to facilitate the transport

4) none of these

A. 1) it is too big to cross the membrane

B. 2) it is a hydrophilic molecule

C. 3) membrane does not have specific proteins to facilitate the transport

D. 4) none of these

Answer: B



Watch Video Solution

63. The term "competent" refers to

A. 1) increasing the competition between cells

B. 2) making cells impermeable for DNA

C. 3) increasing the efficiency with which DNA enters the bacterium through pores in its cell wall

D. 4) making cells permeable for divalent cations

Answer: C



Watch Video Solution

64. The correct sequence of making a cell competent is

A. 1. treatment with divalent cation → incubation of cells with recombinant *DNA* of ice → heat shock ($42^{\circ}C$) → placing on ice

B. 2. heat shock ($42^{\circ}C$) → incubation of cells with recombinant DNA on ice → treatment with divalent cations → placing on ice

C. 3. treatment with divalent cation → placing on ice → incubation of cells with recombinant DNA on ice → heat shock ($42^{\circ}C$)

D. 4. incubation of cells with recombinant DNA on ice \rightarrow heat shock

(42°C) \rightarrow treatment with divalent cations \rightarrow placing on ice.

Answer: A



Watch Video Solution

65. Match the terms given in column I with their definitions in column II

and select the correct answer from codes given below.

Column I

Column II

A. Transformation

(i) Sequences cut by restriction enzymes

B. Recognition site

(ii) Process by which DNA fragments are separated

C. Gel electrophoresis

(iii) Plasmid DNA that has incorporated human DNA

D. Recombinant DNA

(iv) Process by which bacteria take up pieces of DNA

A. 1) A – (iii), B – (i), C – (ii), D – (iv)

B. 2) A – (iv), B – (i), C – (ii), D – (iii)

C. 3) A – (i), B – (ii), C – (iii), D – (iv)

D. 4) A – (ii), B – (iii), C – (iv), D – (i)

Answer: B



[Watch Video Solution](#)

66. Micro-injection is a method used to

- A. 1) produce sticky ends of DNA
- B. 2) provide protection against pathogen
- C. 3) purify the DNA
- D. 4) inject recombinant DNA into the nucleus of an animal cell.

Answer: D



[Watch Video Solution](#)

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

- A. 1) micro-particles
- B. 2) Micro-pipettes

C. 3) Divalent cations

D. 4) UV radiations

Answer: B



Watch Video Solution

68. 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

- 1) silver or tungsten
- 2) arsenic or silver
- 3) gold or tungsten
- 4) none of these

A. 1) silver or tungsten

B. 2) arsenic or silver

C. 3) gold or tungsten

D. 4) none of these

Answer: C



Watch Video Solution

69. The different steps of recombinant DNA technology are given below randomly.

- (i) Isolation of the DNA fragments or genes to be cloned
- (ii) Introduction of the recombinant DNA into a suitable cell (usually *E. coli*) called host (transformation)
- (iii) Multiplication/expression of the introduced gene in the host
- (iv) Selection of the transformed host cells, and identification of the clone containing the desired gene/DNA fragment
- (v) Insertion of the isolated gene in a suitable plasmid vector

Which of the following represents the correct sequences of steps ?

A. A) $(i) \rightarrow (iii) \rightarrow (ii) \rightarrow (iv) \rightarrow (v)$

B. B) $(iii) \rightarrow (ii) \rightarrow (i) \rightarrow (v) \rightarrow (iv)$

C. C) $(i) \rightarrow (v) \rightarrow (ii) \rightarrow (iv) \rightarrow (iii)$

D. D) $(v) \rightarrow (i) \rightarrow (iii) \rightarrow (iv) \rightarrow (ii)$

Answer: C



Watch Video Solution

70. The given flow chart depicts the steps to transfer a desirable gene of interest into a plant.



Identify the missing steps (A,B and C) with regard ot following statements and select the correct option.

(i) Joining of desirable gene to a suitable cloning vector using ligases to create a recombinant DNA molecule.

(ii) Selection of transformed cells.

(iii) Transferring the recombinant DNA molecules to teh target cells.

A. $\begin{matrix} A & B & C \\ (i) & (ii) & (iii). \end{matrix}$

B. $\begin{matrix} A & B & C \\ (i) & (iii) & (ii). \end{matrix}$

- C. $\begin{matrix} A & B & C \\ (ii) & (iii) & (i). \end{matrix}$
- D. $\begin{matrix} A & B & C \\ (iii) & (i) & (ii). \end{matrix}$

Answer: B



Watch Video Solution

71. Fill up the blanks and select the correct option.

(i) EcoRI cuts the DNA between bases_____only when the sequence_____is present in the DNA duplex.

(ii) Disruption of the cell membranes can be achieved by treating the bacterial cells, plant cells and fungal cells with enzymes respectively_____,_____and _____.

(iii) Since DNA has a_____charge, it moves towards the_____of the electrophoretic chamber.

A) (i) G and A, GA A T TC (ii) endonuclease, cellulase, chitinase (ii) negative, anode

B) (i) G and A, G A AT TC (i) lysozyme, cellulase, chitinase (iii) positive, cathode

C) (i) G and A, GA AT C (ii) lysozyme, cellulase, chitinase (ii) negative, anode

D) (i) G and A, GA ATC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode

A. A) (i) G and A, GA A T TC (ii) endonuclease, cellulase, chitinase (ii) negative, anode

B. B) (i) G and A, G A AT TC (i) lysozyme, cellulase, chitinase (iii) positive, cathode

C. C) (i) G and A, GA AT C (ii) lysozyme, cellulase, chitinase (ii) negative, anode

D. D) (i) G and A, GA ATC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode

Answer: C



Watch Video Solution

72. In the isolation of DNA, removal of protein and RNA is carried out by enzymes _____ and _____ respectively.

1) lysozyme, ribonuclease

2) protease, cellulase

3) protease, ribonuclease

4) ribonuclease, chitinase

A. 1) lysozyme, ribonuclease

B. 2) protease, cellulase

C. 3) protease, ribonuclease

D. 4) ribonuclease, chitinase

Answer: C



Watch Video Solution

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

A. a) bromophenol blue

B. b) chilled ethanol

C. c) ethidium bromide

D. d) both (a) and (c)

Answer: B



Watch Video Solution

74. Precipitates of purified DNA after the addition of chilled ethanol are seen as a collection of the fine threads in suspension. This process is referred as

A. 1) DNA transformation

B. 2) DNA ligation

C. 3) DNA spooling

D. 4) DNA duplication

Answer: C



Watch Video Solution

75. Match column I with column II and select the correct answer from the given codes.

Column I

Column II

- | | |
|-------------------------|--------------------------|
| A. Recombinant DNA | (i) Chilled ethanol |
| B. Precipitation of DNA | (ii) DNA staining |
| C. Transposons | (iii) Jumping genes |
| D. Ethidium bromide | (iv) Genetic engineering |

1) A – (iv), B – (i), C – (iii), D – (ii)

2) A – (i), B – (iii), C – (ii), D – (iv)

3) A – (ii), B – (i), C – (iii), D – (iv)

4) A – (iv), B – (ii), C – (i), D – (iii)

A. 1) A – (iv), B – (i), C – (iii), D – (ii)

B. 2) A – (i), B – (iii), C – (ii), D – (iv)

C. 3) A – (ii), B – (i), C – (iii), D – (iv)

D. 4) A – (iv), B – (ii), C – (i), D – (iii)

Answer: A



Watch Video Solution

76. The polymerase chain reaction is a technique used for

- 1) amplification of DNA
- 2) amplification of enzymes
- 3) amplification of proteins
- 4) all of these

- A. 1) amplification of DNA
- B. 2) amplification of enzymes
- C. 3) amplification of proteins
- D. 4) all of these

Answer: A



Watch Video Solution

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

- 1) polymerase chain reaction
- 2) southern blotting
- 3) northern blotting
- 4) None of these

A. 1) polymerase chain reaction

B. 2) southern blotting

C. 3) northern blotting

D. 4) None of these

Answer: A



Watch Video Solution

78. Primers are

- 1) chemically synthesised oligonucleotides that are complementary to the

regions of DNA

2) chemically synthesised oligonucleotides that are not complementary to the regions of DNA

3) chemically synthesised, autonomously replicating circular DNA molecules

4) specific sequences present on recombinant DNA

A. 1) chemically synthesised oligonucleotides that are complementary to the regions of DNA

B. 2) chemically synthesised oligonucleotides that are not complementary to the regions of DNA

C. 3) chemically synthesised, autonomously replicating circular DNA molecules

D. 4) specific sequences present on recombinant DNA

Answer: A



Watch Video Solution

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

- 1) *Agrobacterium tumefaciens*
- 2) *Thermus aquaticus*
- 3) *Streptomyces albus*
- 4) *Escherichia coli*

A. 1) *Agrobacterium tumefaciens*

B. 2) *Thermus aquaticus*

C. 3) *Streptomyces albus*

D. 4) *Escherichia coli*

Answer: B



Watch Video Solution

80. Which of the following statements are correct for the enzyme Taq polymerase ?

- (i) It remains active during the high temperature induced denaturation of dsDNA.
- (ii) It requires primers for carrying out the process of polymerisation.
- (iii) It synthesises the RNA region between the primers, using dNTPs and Mg^{2+} .

- A. a) (i) and (ii)
- B. b) (ii) and (iii)
- C. c) (i),(ii) and (iii)
- D. d) None of these

Answer: A



Watch Video Solution

81. Match column I (enzyme) with column II (characteristic/activity) and select the correct answer from the given codes,

Column I

- A. Taq DNA polymerase
- B. Exonuclease
- C. Protease
- D. Chitinase

Column II

- (i) Cleaves the ends of linear DNA
- (ii) Breakdown of fungal cell wall
- (iii) Stable above $90^{\circ}C$
- (iv) Made only by eukaryotic cells
- (v) Degradation of proteins

1) A - (iii), B - (iv), C - (i), D - (ii)

2) A - (iv), B - (iii), C - (i), D - (ii)

3) A - (ii), B - (i), C - (v), D - (iii)

4) A - (iii), B - (i), C - (v), D - (ii)

A. 1) A - (iii), B - (iv), C - (i), D - (ii)

B. 2) A - (iv), B - (iii), C - (i), D - (ii)

C. 3) A - (ii), B - (i), C - (v), D - (iii)

D. 4) A - (iii), B - (i), C - (v), D - (ii)

Answer: D



Watch Video Solution

82. Which one of the following is not a correct match ?

- A. a) Tumour inducing - Ti plasmid
- B. b) DNA probe - Identifies the desired DNA fragment
- C. c) PCR - DNA staining
- D. d) Agarose - Sea weeds

Answer: C



Watch Video Solution

83. The correct sequence of different steps of polymerease chain reaction is

- 1) annealing → denaturation → extension
- 2) denaturation → extension → annealing
- 3) denaturation → annealing → extension
- 4) extension → denaturation → annealing

A. 1) annealing → denaturation → extension

B. 2) denaturation → extension → annealing

C. 3) denaturation → annealing → extension

D. 4) extension → denaturation → annealing

Answer: C



Watch Video Solution

84. Given table gives an account of differences between PCR and gene cloning. Which of the following points shows the incorrect difference ?

Parameter	<i>PCR</i>	Gene cloning
1. Efficient	More	Less
2. Apparatus Requirement	<i>DNA</i>	Restriction enzyme, ligase, vec
3. Manipulation	in vitro	in vitro and in vivo
4. cost	More	Less
5. Automation	Yes	<i>No</i>
6. Error probability	Less	More
7. Time for a typical experiment	2-4days	<i>4hours</i>
8. Application	More	Less

a) 1 and 3

b) 4,5 and 6

c) 4 and 7

d) 4,7 and 8

A. a) 1 and 3

B. b) 4,5 and 6

C. c) 4 and 7

D. d) 4,7 and 8

Answer: C



Watch Video Solution

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

A. a) Primers, $dNTPs$ and DNA polymerase

B. b) DNA , $CaCl_2$ and nuclease

C. c) Mg^{2+} , DNA

D. d) Both (a) and (c)

Answer: D



Watch Video Solution

86. In a polymerase chain reaction, temperature required for the steps

(i) Denaturation,

(ii) Annealing and

(iii) Extension are respectively

A) (i) 94°C (ii) 40°C (iii) 72°C

B) (i) 40°C (ii) 72°C (iii) 94°C

C) (i) 94°C (ii) 72°C (iii) 40°C

D) (i) 72°C (ii) 94°C (iii) 40°C

A. A) (i) 94°C (ii) 40°C (iii) 72°C

B. B) (i) 40°C (ii) 72°C (iii) 94°C

C. C) (i) 94°C (ii) 72°C (iii) 40°C

D. D) (i) 72°C (ii) 94°C (iii) 40°C

Answer: A



Watch Video Solution

87. In addition to Taq polymerase enzyme which other thermostable DNA polymerases have been isolated to be used in polymerase chain Reaction (*PCR*)?

- A. a) Pfu polymerase isolated from *Pyrococcus furiosus*
- B. b) Tli polymerase(vent ploymerase) isolated from *Thermococcus litoralis*
- C. c) Both (a) and (b)
- D. d) None of these

Answer: C



Watch Video Solution

88. Given figures represents the steps involved in polymerase chain reaction (*PCR*). Identify the steps A,B,C and C and select the correct

option.



A.

A

B

Denaturation at $94 - 96^{\circ}C$ Extension through Taq polymerase at

B.

A

B

C

Denaturation at $94 - 96^{\circ}C$ Annealing at $40 - 60^{\circ}C$ Extension

C.

A

B

C

Denaturation at $40 - 60^{\circ}C$ Annealing at $72^{\circ}C$ Extension through

D.

A

B

Extension through Taq polymerase at $72^{\circ}C$ Denaturation at $40^{\circ}C$

Answer: B



View Text Solution

89. In a polymerase chain reaction after the denaturation step why the mixture needs to cool down to a lower temperature ?

- a) To permit specific annealing of the primers
- b) To give a halt to the reaction mixture
- c) To increase the activity of enzyme Taq polymerase
- d) To obtain the multiple copies of the DNA

- A. a) To permit specific annealing of the primers
- B. b) To give a halt to the reaction mixture
- C. c) To increase the activity of enzyme Taq polymerase
- D. d) To obtain the multiple copies of the DNA

Answer: A



Watch Video Solution

90. If a recombinant DNA bearing gene for resistance to antibiotic ampicillin is transferred to E.coli cells, the host cells become transformed into ampicillin resistant cells. If such bacteria are transferred on agar plates containing ampicillin, only transformants will grown and the untransformed recipient cells will die. The ampicillin resistant gene in this

case is called as

- 1) selectable marker
- 2) recombinant protein
- 3) cloning site
- 4) chemical scalpels

- A. 1) selectable marker
- B. 2) recombinant protein
- C. 3) cloning site
- D. 4) chemical scalpels

Answer: A



Watch Video Solution

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

- A. 1) Micro-injection method

B. 2) Gene gun method

C. 3) Bioreactor

D. 4) Disarmed pathogen vectors

Answer: C



Watch Video Solution

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

1)PCR

2) agitator

3) bioreactor

4) assimilator

A. 1)PCR

B. 2) agitator

C. 3) bioreactor

D. 4) assimilator

Answer: C



Watch Video Solution

93. Which of the following statements are correct with respect to a bioreactor ?

- (i) It can process large volumes of culture.
- (ii) It provides optimum temperature and pH.
- (iii) It is a completely automated tool.
- (iv) It is a compact thermal cyclers.

A. a) (i) and (ii)

B. b) (i),(ii) and (iii)

C. c) (iii) and (iv)

D. d) (ii) and (iii)

Answer: A



Watch Video Solution

94. Identify the figures (A) and (B) and select the correct option.



- A. (A) (B).
Spargal stirred-tank bioreactor Simple stirred-tank bioreactor
- B. (A) (B).
Spargal stirred-tank bioreactor Sparged stirred-tank bioreactor
- C. (A) (B).
Simple stirred-tank Sparged stirred-tank bioreactor
- D. (A) (B).
Simple stirred-tank bioreactor Simple stirred-tank bioreactor

Answer: C



View Text Solution

95. Stirred-tank bioreactors have advantages over shake flasks because they

- A. a) provide high temperature and pH
- B. b) provide better aeration and mixing properties
- C. c) do not allow the entry of CO_2
- D. d) are easy to operate

Answer: B



Watch Video Solution

96. After completion of the biosynthetic stage in the bioreactors, the product undergoes separation and purification processes, collectively termed as

- A. a) transformation
- B. b) electrophoresis
- C. c) downstream processing
- D. d) upstream processing

Answer: C



Watch Video Solution

97. Study the following statements regarding recombinant DNA technology and select the incorrect ones.

- (i) Taq polymerase extends the primers using the nucleotides provided in the reaction.
- (ii) Antibiotic resistance genes are considered as desirable genes in recombinant DNA technology.
- (iii) DNA fragments are separated according to their charge only, in agarose gel electrophoresis.
- (iv) Transformation is a procedure through which a piece of DNA is integrated in to the genome of a host bacterium.
- (v) To produce higher yields of a desired protein, host cells can be multiplied in a continuous culture.
- (vi) Downstream processing is one of the steps of polymerase chain reaction.

A. a) (ii),(iii) and (vi)

B. b) (i),(iii) and (v)

C. c) (ii),(iii) and (v)

D. d) (i),(iv) and (v)

Answer: A



Watch Video Solution

98. Read the following statements and select the incorrect ones.

(i) When the transformed cells on agar plates containing ampicillin are spread, both transformed and untransformed cells will grow.

(ii) Restriction enzymes are used in isolation and separation of DNA from other macromolecules.

(iii) Downstream processing is one of the steps of rDNA technology.

(iv) Disarmed pathogen vectors are also used in transfer of rDNA into the host.

a) (i) and (iii)

b) (iii) and (iv)

c) (i) and (iii)

d) (i) and (ii)

A. a) (i) and (iii)

B. b) (iii) and (iv)

C. c) (i) and (iii)

D. d) (i) and (ii)

Answer: D



Watch Video Solution

99. Match the scientists in column I with their related discoveries in column II and select the correct option from the given codes.

Column I

A. Kary Mullis

B. Paul Berg

C. Stanley Cohen and Herbert Boyer

D. Arber smith and Nathan

Column II

(i) Father of genetic engineering

(ii) Nobel prize for the discovery of

(iii) Developed polymerase chain re

(iv) Isolated an antibiotic resistance

A. 1) $A - (iii), B - (i), C - (iv), D - (ii)$

B. 2) $A - (iii), B - (iv), C - (i), D - (ii)$

C. 3) $A - (iv), B - (ii), C - (iii), D - (i)$

D. 4) $A - (i), B - (iii), C - (iv), D - (ii)$

Answer: A



Watch Video Solution

100. Select the correct option to fill up balnks.

(i) _____ is a natural polymer extracted from_____.

(ii) The DNA fragments purified by gel electrophoresis are used in constructing_____by joining them with_____.

(iii) The ligation of alien DNA is carried out at a_____. present in one of the two_____in a plasmid vector.

(iv)_____enzyme remains active during the high temperature induced denaturation of ds DNA

(v) DNA fragments are resolved according to their_____ through

_____in agarose gel electrophoresis.

a) (i) Agarose, sea weeds (ii) recombinant DNA, cloning vector (iii) restriction site, antibiotic resistance genes (iv) Taq polymerase (v) size, sieving effect

b) (i) Agarose, sea weeds (ii) Restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v) size, sieving effect

c) (i) Agarose, sea weeds (ii) restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerease (v) size, sieving effect

d) (i) size, sieving effect (ii) agarose, seaweeds (iii) recombinant DNA cloning vector (iv) Taq polymerase (v) restriction site, antibiotic resistance genes

A. a) (i) Agarose, sea weeds (ii) recombinant DNA, cloning vector (iii) restriction site, antibiotic resistance genes (iv) Taq polymerase (v) size, sieving effect

B. b) (i) Agarose, sea weeds (ii) Restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v)

size, sieving effect

C. c) (i) Agarose, sea weeds (ii) restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerease (v) size, sieving effect

D. d) (i) size, sieving effect (ii) agarose, eas weeds (iii) recombinant DNA cloning vector (iv) Taq polymerase (v) restriction site, antibiotic resistance genes

Answer: A



Watch Video Solution

101. Four mutant strians of bacteria (1-4) all require substance S to grow (each strian is blocked at one step in the S-biosynthesis pathway). Four plates were prepared with mininmal medium and a trace of substance, S to allow a small amount of growth of mutant cells. on plate A, mutant cells of strain 1 were spred over entire surface of tha agar to form a thin

law of bacteria. On plate B, the lawn was composed of mutant cells of strain 2, and so on. On each plate, cells of each of the four mutant types were inoculated over the lawn, as indicated in the figure by the circles. dark circles indicate excellent growth. A strain blocked at a later step in the S substance metabolic pathway accumulates intermediates that can 'feed' a strain blocked at an earlier step.



What is the order of genes (1-4) in the metabolic pathway for synthesis of substance S ?

A. $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$

B. $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C. $1 \rightarrow 3 \rightarrow 4 \rightarrow 2$

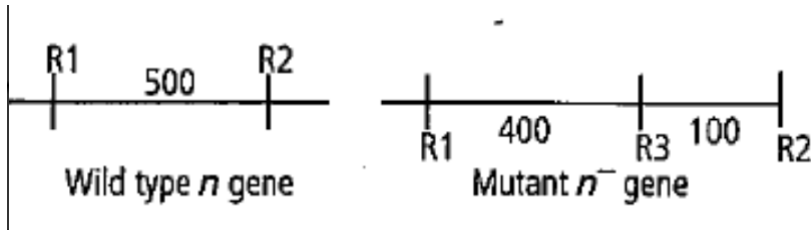
D. $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$

Answer: C



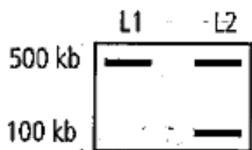
View Text Solution

102. The figure shows the restriction enzyme cutting sites ($R1 - R3$) in wild type (n) and mutant (n^-) gene.

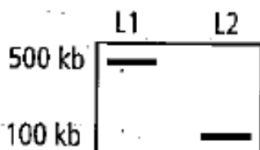


If a radioactively labelled probe (that hybridises at a sequence close to $R1$) is used for detecting the presence of DNA fragments after gel electrophoresis and Southern blotting, which of the following band patterns will you expect ?

Note : L1 : wild type DNA, L2: mutant DNA



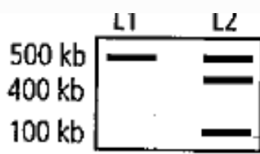
A. (a)



B. (b)



C. (c)



D. (d)

Answer: C



Watch Video Solution

103. Analyse the given diagram which steps involved in the procedure of selecting transformed bacteria.



Identify the bacterial colony which has undergone transformation ?

A. colony 5

B. Colony 2

C. Colony 4

D. Colony 3

Answer: C

[View Text Solution](#)

104. The nucleic acid extracted from animal liver is loaded and run on agarose gel. After staining, it shows following pattern :



If the remaining sample is treated with RNase and loaded in gel what result would you expect ?

A.

B.

C.

D.

Answer: A

[View Text Solution](#)

105. The basic procedure involved in the synthesis of recombinant DNA molecule is depicted below. The mistake in the procedure is



- A. Enzyme polymerase is not included.
- B. The mammalian DNA is shown double stranded
- C. Two different restriction enzymes are used.
- D. Only one fragment is inserted

Answer: C



View Text Solution

106. Rising of dough is due is

- A. a) multiplication of yeast
- B. b) production of CO_2
- C. c) emulsification

D. d) hydrolysis of wheat flour starch into sugars.

Answer: B



Watch Video Solution

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

- A. a) endonuclease
- B. b) exonuclease
- C. c) DNA ligase
- D. d) Hind II

Answer: B



Watch Video Solution

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

- A. a) transduction
- B. b) conjugation
- C. c) transformation
- D. d) translation

Answer: A



Watch Video Solution

109. Which of the given statements is correct in the context of observing DNA separated by agarose gel electrophoresis ?

- A. a) DNA can be seen in visible light
- B. b) DNA can be seen without staining in visible light.
- C. c) Ethidium bromide stained DNA can be seen in visible light.

D. d) Ethidium bromide stained DNA can be seen under exposure to
UV light

Answer: D



Watch Video Solution

110. Restriction' in restriction enzyme refers to

- A. a) cleaving of phosphodiester bond in DNA by the enzyme
- B. b) cutting of DNA at specific position only
- C. c) prevention of the multiplication of bacteriophage in bacteria
- D. d) all of the above

Answer: C



Watch Video Solution

111. 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.coil

Answer: D



Watch Video Solution

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

- A. 1) charge only
- B. 2) size only
- C. 3) charge to size ratio

D. 4) all of the above

Answer: B



Watch Video Solution

113. The most important feature in a plasmid to be used as a vector is

- A. a) origin of replication (ori)
- B. b) presence of a selectable marker
- C. c) presence of sites for restriction endonuclease
- D. d) its size

Answer: A::B::C::D



Watch Video Solution

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

- A. a) Lysozyme
- B. b) Ribonuclease
- C. c) Deoxyribonuclease
- D. d) Protease

Answer: C



Watch Video Solution

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

- A. a) Easy availability of DNA template
- B. b) Availability of synthetic primers
- C. c) Availability of cheap deoxyribonucleotides

D. d) Availability of 'thermostable' DNA polymerase

Answer: D



Watch Video Solution

116. An antibiotic resistant gene in a vector usually helps in the selection of

- A. a) competent cells
- B. b) transformed cells
- C. c) recombinant cells
- D. d) none of the above

Answer: B



Watch Video Solution

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

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

Answer: C



Watch Video Solution

118. The role of DNA ligase in the construction of a recombinant DNA molecule is

- A. a) formation of phosphodiester bond between two DNA fragments
- B. b) formation of hydrogen bonds between sticky ends of DNA fragments

C. c) ligation of all purine and pyrimidine bases

D. d) none of the above

Answer: A



Watch Video Solution

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

(a) Haemophilus influenzae

(b) Escherichia coli

(c) Entamoeba coli

(d) Bacillus amyloliquefaciens

A. Haemophilus influenzae

B. Escherichia coli

C. Entamoeba coli

D. Bacillus amyloliquefaciens

Answer: C



[Watch Video Solution](#)

120. 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 and on the template DNA
- (d) All of the above

- A. Denaturation of template DNA
- B. Annealing of primers to template DNA
- C. Extension of primer and on the template DNA
- D. All of the above

Answer: C



[Watch Video Solution](#)

121. A bacterial cell was transformed with a recombinant DNA that was generated using a human gene. However, the transformed cells did not produce the desired protein. Reason could be

- (a) Human gene may have intron which bacteria cannot process
- (b) Amino acid codons for humans and bacteria are different
- (c) Human protein is formed but degraded by bacteria
- (d) all of the above

A. human gene may have intron which bacteria cannot process

B. amino acid codons for humans and bacteria are different

C. human protein is formed but degraded by bacteria

D. all of the above

Answer: A



Watch Video Solution

122. Which of the following should be chosen for best yield if one were to produce a recombinant protein in large amounts ?

- (a) Laboratory flask of largest capacity
- (b) A stirred-tank bioreactor without in-lets and out-lets
- (c) A continuous culture system
- (d) Any of the above

A. Laboratory flask of largest capacity

B. A stirred-tank bioreactor without in-lets and out-lets

C. A continuous culture system

D. Any of the above

Answer: C



Watch Video Solution

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

- (a) Herbert Boyer
- (b) Hargovind Khurane
- (c) Kary Mullis
- (d) Arthur Kornberg

- A. Herbert Boyer
- B. Hargovind Khurane
- C. Kary Mullis
- D. Athur Kornberg

Answer: C



Watch Video Solution

124. 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

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



Watch Video Solution

125. Assertion : In a chemical engineering process, it is necessary to prepare sterile ambience.

Reason : Sterile ambience inhibits the growth of undesirable microbes during manufacture of product like antibiotics, vaccines and enzymes.

A. a) Both assertion and reason are true and reason is correct explanation of assertion.

B. b) Both assertion and reason are true but reason is not correct explanation for assertion.

C. c) Assertion is true but reason is false.

D. d) Assertion is false but reason is true.

Answer: A



Watch Video Solution

126. Assertion : Asexual reproduction is more important with regard to biotechnology.

Reason : Asexual reproduction preserves the genetic information while sexual reproduction permits variations.

A. a) Both assertion and reason are true and reason is correct explanation for assertion.

B. b) Both assertion and reason are true but reason is not the correct explanation for assertion.

C. c) Assertion is true but reason is false.

D. d) Assertion is false but reason is true.

Answer: A



Watch Video Solution

127. Assertion : Genetic engineering can overcome the drawbacks of traditional hybridisation.

Reason : Genetic engineering can create desired DNA sequences to meet specific requirements.



Watch Video Solution

128. Assertion : A piece of DNA inserted into an alien organism generally does not replicate if not inserted into a chromosome.

Reason : Chromosomes have specific sequences called ori region where DNA replication is initiated.



[Watch Video Solution](#)

129. Assertion : Genetic engineering requires both nuclease and ligases.

Reason : Ligases produce the nick in the recombinant DNA molecule.



[Watch Video Solution](#)

130. Assertion : Restriction enzymes *Hin* and *Hpa* are produced from two different genera of bacteria.

Reason : *Hin* is produced from *Haemophilus* while *Hpa* is produced from *Hematococcus*.



[Watch Video Solution](#)

131. Assertion : Restriction enzymes recognise palindromic sequences.

Reason : Palindromic sequences read same in both directions of the two strand.

A. d) Both assertion and reason are false.

B.

C.

D.

Answer: B



Watch Video Solution

132. Assertion : The matrix used in gel electrophoresis should have controllable pore size.

Reason : Agarose concentration can be changed to change pore sizes.

A. a) Both assertion and reason are true and reason is correct explanation for assertion

B. b) Both assertion and reason are true but reason is not correct explanation of assertion

C. c) Assertion is true but reason is false.

D. d) Both assertion and reason are false.

Answer: B



[Watch Video Solution](#)

133. Assertion : All expression vectors are cloning vectors and vice versa.

Reason : Expression vectors have at least the regulatory sequences i.e., promotes, operators, ribosomal binding sites, etc having optimum function in the chosen control but not origin of replication.



[Watch Video Solution](#)

134. Assertion : E.coli having pBR322 with DNA insert at BamHI site cannot grow in medium containing tetracycline.

Reason : Recognition site for BamHI is present in ter^R region of pBR22.



[Watch Video Solution](#)

135. Assertion : A bacterial cell with restriction enzymes will be easily infected and lysed by bacteriophages.

Reason : Restriction enzymes catalyse synthesis of protective coat around bacterial cell that prevents bacteriophage attack.



[Watch Video Solution](#)

136. Assertion : Special methods are used for transformation i.e., incorporation of recombinant DNA into host.

Reason : DNA is a hydrophilic molecule.



[Watch Video Solution](#)

137. Assertion : Use of chitinase enzyme is necessary for isolation of DNA from yeast cells but not in case of Spirogyra.

Reason : Fungal cell wall is made up of fungal cellulose or chitin.



[Watch Video Solution](#)

138. Assertion : PCR primers must not have self complementary regions.

Reason : Self complementary regions result in hairpin structures adversely affecting the PCR.



Watch Video Solution

139. Assertion : Downstream processing is generally considered more difficult and costlier in plants than that in microbes.

Reason : Rhizosecretion is used as a method to facilitate easier recovery of recombinant proteins from plants.



Watch Video Solution