1. Which of the following involves remarkable capacity of a short segment of DNA to move from one place to another?  
a) DNA transposition  
b) DNA replication  
c) Translation  
d) Transcription  
View Answer

2. Which of the following process occurs between DNA molecules of very similar sequences?  
a) Homologous genetic recombination  
b) Site specific recombination  
c) Non-homologous recombination  
d) Replicative recombination  
View Answer

3. Which of the following process occurs in regions where no large –scale sequence similarity is apparent?  
a) Homologous genetic recombination  
b) Site specific recombination  
c) Non-homologous recombination  
d) Replicative recombination  
View Answer

Answer: c  
Explanation: Site-specific recombination occurs between particular short sequences present on otherwise dissimilar parental molecules.  
Replicative recombination generates a new copy of the transposable element at a new location of DNA.  
Homologous genetic recombination occurs between DNA molecules of very similar sequences.

4. Which of the following process generates a new copy of the transposable element at a new location of DNA?  
a) Homologous genetic recombination  
b) Site specific recombination  
c) Non-homologous recombination  
d) Replicative recombination  
View Answer

5. Which of the following occurs between particular short sequences present on otherwise dissimilar parental molecules?  
a) Homologous genetic recombination  
b) Site specific recombination  
c) Non-homologous recombination  
d) Replicative recombination  
View Answer

6. Which of the following promotes branch migration at higher rates than does Rec-A?  
a) Rec-B  
b) Rec-C  
c) Rec-D  
d) Ruv-A and Ruv-B  
View Answer

7. Which of the following is called a resolvase?  
a) Ruv-C  
b) Ruv-A  
c) Ruv-B  
d) Rec-A  
View Answer

8. Which of the following does not code for an enzyme having both helicase and nuclease activity?  
a) Rec-A  
b) Rec-B  
c) Rec-C  
d) Rec-D  
View Answer

9. The sequences of the recombination sites recognized by site-specific recombinases are \_\_\_\_\_\_\_\_\_\_\_\_  
a) Partially asymmetric  
b) Partially symmetric  
c) Symmetric  
d) Palindromic  
View Answer

10. Which of the following contains only the sequences required for transposition and the genes for proteins that promote the process?  
a) Insertion sequences  
b) Complex transposons  
c) Transposons  
d) Chromosomes

11. Who developed the chemical techniques to synthesize polynucleotides?  
a) Barbara McClintock  
b) James Watson  
c) Fredrick Sanger  
d) H. Gobind Khorana  
View Answer

12. Which of the following enzymes in bacteria are responsible for restricting the growth of viruses?  
a) restriction endonuclease  
b) topoisomerase  
c) gyrase  
d) protease  
View Answer

13. EcoR1 exhibits a two-fold rotational symmetry.  
a) True  
b) False  
View Answer

14. Which enzyme is used to join together two different types of DNA molecules?  
a) ligase  
b) endonuclease  
c) exonuclease  
d) protease  
View Answer

15. The first recombinant DNA molecule was synthesized in the year \_\_\_\_\_\_\_\_\_\_\_\_\_\_  
a) 1962  
b) 1972  
c) 1982  
d) 1992

16. Which observation was made by Avery, Macleod, and McCarty?  
a) DNA is a duplex molecule  
b) DNA can be taken up from medium  
c) DNA can denature at high temperatures  
d) DNA is more stable than RNA  
View Answer

17. Recombinant plasmids are added to a bacterial culture that has been pretreated with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions.  
a) iodine  
b) magnesium  
c) calcium  
d) ferric  
View Answer

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**18. Binary fission in bacteria does not involve**

(a) spindle formation

(b) DNA duplication

(c) Cytokinesis

(d) Cell elongation

**Answer: (a)**

**19. Transfer of genetic material from the donor to recipient bacterium through cell contact is termed as**

(a) transduction

(b) recombination

(c) conjugation

(d) transformation

**Answer: (c)**

**20. Common vegetative reproduction in bacteria is by**

(a) conjugation

(b) budding

(c) oidia

(d) binary fission

**Answer: (d)**

**21. Transfer of genetic material in bacteria through virus is termed as**

(a) transduction

(b) recombination

(c) conjugation

(d) transformation

**Answer: (a)**

**22. Genetic recombination between bacterial cells is first demonstrated by**

(a) Ochoa and Kornberg

(b) Har Gobind Khorana

(c) H. J. Muller

(d) Lederberg and Tatum

**Answer: (d)**

**23. Which of the following methods of reproduction proved for the first time that DNA is genetic material?**

(a) Binary fission

(b) Conjugation

(c) Transduction

(d) Transformation

**Answer: (d)**

**24. Mode of action of penicillin is by**

(a) inhibiting RNA synthesis

(b) inhibiting cell wall formation

(c) destroying chromatin

(d) inhibiting spindle formation

**Answer: (b)**

**25. Bacterial sex factor is**

(a) F-factor

(b) col-factor

(c) R-factor

(d) RNA

**Answer: (a)**

**26. Which of the following bacteriophages are responsible for specialised transduction?**

(a) T4 phages

(b) Lysogenic phages

(c) Lytic phages

(d) Both (b) and (c)

**Answer: (b)**

**27. Transduction was discovered by**

(a) Zinder and Lederberg

(b) Ivanovsky

(c) Griffith

(d) Avery et al

**Answer: (a)**



**28. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?**

(a) X phage

(b) Retrovirus

(c) Ti plasmid

(d) PBR 322

**Answer: B**

**29. Which kind of therapy was given in 1990 to a four year old girl with Adenosine Deaminase deficiency (ADA)?**

(a) Gene therapy

(b) Chemo therapy

(c) Immunotherapy

(d) Radiation therapy

**Answer: A**

**30. The two polypeptides of human insulin are linked together by\_\_\_\_\_\_\_\_**

(a) Phosphodiester bond

(b) Covalent bond

(c) Disulphide bridges

(d) Hydrogen bonds

**Answer: C**

**31. Which part of the tobacco plant is infected bycMeloidogyne incognitia?**

(a) Leaf

(b) Root

(c) Stem

(d) Flower

**Answer: B**

**32. In Bt Cotton, the Bt toxin present in plant tissue as protoxin is converted into active toxin due to\_\_\_\_\_\_\_\_\_\_**

(a) Alkaline PH of the insect gut

(b) Acidic pH of the insect gut

(c) Action of gut microorganism

(d) Presence of conversion factors in insect gut

**Answer: A**

**33. The first human hormone produced by recombinant DNA technology is\_\_\_\_\_\_**

(a) Insulin

(b) Thyroxin

(c) Estrogen

(d) Progesterone

**Answer:A**

**34. Which of the following Bt crops is being grown in India by the farmers?**

(a) Brinjal

(b) Maize

(c) Soyabean

(d) Cotton

**Answer: D**

**35. Tobacco plant resistant to a nematode have beencdeveloped by the introduction of DNA that produced in the host cells\_\_\_\_\_\_\_\_\_\_**

(a) Both sense and anti-sense RNA

(b) A particular hormone

(c) An antifeedant

(d) A toxic protein

**Answer: A**

**36. The first clinical gene therapy was given for treating\_\_\_\_\_\_\_\_\_\_**

(a) Diabetes mellitus

(b) Chicken pox

(c) Rheumatoid arthritis

(d) Adenosine Deaminase deficiency

**Answer: D**

**37. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services\_\_\_\_\_\_\_\_**

(a) Bio-safety committee

(b) Indian council for Agriculture Research

(c) Genetic engineering Approval Committee

(d) Research Committee on Genetic Manipulation.

**Answer: C**

**38. Maximum number of existing transgenic animalsis of\_\_\_\_\_\_\_\_\_**

(a) Fish

(b) Cow

(c) Pig

(d) Mice

**Answer: D**

**39. Genetic engineering has been successfully used for producing:**

(a) Transgenic mice for testing safety of polio vaccine before use in humans\_\_\_\_\_\_\_\_

(b) Transgenic models for studying new treatments for certain cardiac diseases

(c) Transgenic cow - Rosie which produces high fat milk for making ghee

**40. Transgenic animals are those which have\_\_\_\_\_\_\_\_**

(a) Foreign DNA in some of its cells

(b) Foreign DNA in all its cells

(c) Foreign RNA in all its cells

(d) DNA and RNA both in the cells

**Answer: B**

**41.The silencing of mRNA has been used in producing transgenic plants resistant to:**

(a) Boll worms

(b) White rusts

(c) Nematodes

(d) Bacterial blights

**Answer: C**

**42. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?**

(a) The larger the fragment size, the farther it moves

b) The smaller the fragment size, the farther it moves

(c) Positively charged fragments move to farther end

(d) Negatively charged fragments do not move

**Answer: B**

**43. A gene whose expression helps to identify transformed cell is known as\_\_\_\_\_\_\_\_\_\_\_**

(a) Selectable marker

(b) Vector

(c) Plasmid

(d) Structural gene

**Answer: A**

**44. Which one of the given options correctly identifies its certain component(s)?**

(a) Ori - original restriction enzyme

(b) Rop - Reduced osmotic pressure

(c) Hind I, EcoR I - selectable markers

(d) AmpR, tetR - antibiotic resistance genes

**Answer: D**

**45. There is a restriction endonuclease called EcoRI. What does 'co part in it stand for?**

(a) Coelom

(b) Coli

(c) Colon

(d) Coenzyme

**Answer: B**

**46. Given below is a sample of a portion of DNA strand giving the base sequence on the oppositevstrands?**

**5'\_\_\_\_\_\_\_\_\_\_\_\_GAATTC\_\_\_\_\_\_\_\_\_\_\_\_3'**

**5'\_\_\_\_\_\_\_\_\_\_\_\_CTTAAG\_\_\_\_\_\_\_\_\_\_\_\_3'**

**46. What is so special shown in it?**

(a) Replication completed

(b) Deletion mutation

(c) Start codon at the 5' end

(d) Palindromic sequence of base pairs

**Answer: D**

**47. The DNA fragments separated on an agarose gel can be visualised after staining with\_\_\_\_\_\_\_\_\_\_**

(a) Bromophenol blue

(b) Acetocarmine

(c) Aniline blue

(d) Ethidium bromide

**Answer: D**

**48. Which of the following restriction enzymes produces blunt ends?**

(a) Eco RV

(b) Sal I

(c) Hind III

(d) Xho I

**Answer: A**

**49. A foreign DNA and plasmid cut by the me restriction endonuclease can be joined to forma recombinant plasmid using\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Eco RI

(b) Taq polymerase

(c) Ligase

(d) Polymerase II

**Answer: C**

**50. Which of the following is not a feature of the plasmid?**

(a) Single stranded

(b) Independent replication

(c) Circular structure

(d) Small, circular double-stranded

**Answer: A**

**51. Commonly used vectors for human genome sequencing are\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) T-DNA

(b) BAC vectors

(c) T/C cloning vector

(d) Expression vector

**Answer: B**

**52. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by\_\_\_\_\_\_\_\_\_**

(a) Centrifugation

(b) Polymerase Chain Reaction

(c) Electrophoresis

(d) Restriction mapping

**Answer: C**

**53. Biolistics (Gene gun) is suitable for\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Disarming pathogen vectors

(b) Iransformation of plant cells

(c) Joining of DNA Vector

(d) DNA Fingerprinting

**Answer: B**

**54. The correct order of steps in Polymerase Chain Reaction (PCR) is\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Denaturation, Extension, Annealing

(b) Annealing, Extension, Denaturation

(c) Extension, Denaturation, Annealing

(d) Denaturation, Annealing, Extension

**Answer: D**

**55. The process of separation and purification of expressed protein before marketing is called\_\_\_\_\_\_\_\_\_\_**

(a) Upstream processing

(b) Downstream processing

(c) Bioprocessing

(d) Postproduction processing

**Answer: B**

**56. Which of the following is not a component of downstream processing?**

(a) Separation

(b) Preservation

(c) Purification

(d) Expression

**Answer: D**

**57. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Eco RI

(b) Polymerase III

(c) Taq polymerase

(d) Ligase

**Answer: D**

**58. Stirred-tank bioreactors have been designed for\_\_\_\_\_\_\_\_\_**

(a) Purification of product

(b) Addition of preservatives to the product

(c) Availability of oxygen throughout the Process

(d) Ensures aerobic conditions in the culture vessels

**Answer: C**

**59. The Taq polymerase enzyme is obtained from\_\_\_\_\_\_\_**

(a) Thiobacillus ferroxidans

(b) Bacillus subtilis

(c) Pseudomonas putida

(d) Thermus aquaticus

**Answer: D**

**60. Which of the following is a restriction endonuclease?**

(a) DNase I

(b) Hind II

(c) Protease

(d) RNase

**Answer: B**

**61. The cutting of DNA at specific locations became possible with the discovery of\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Restriction enzymes

(b) Probes

(c) Selectable markers

(d) Ligases

**Answer: A**

**62. Which one is true statement regarding DNA polymerase used in PCR?**

(a) It is used to ligate introduced DNA in recipient

(b) It serves as a selectable marker

(c) It is isolated from a virus

(d) It remains active at high temperature

**Answer: D**

**63. Which one of the following is a case of wrong matching?**

(a) Somatic hybridization - Fusion of two diverse cells

(b) Vector DNA - Site for tRNA synthesis

(c) Micro propagation-In vitro production of plants in large numbers

(d) Callus - Unorganized mass of cells

**Answer : B**

**64. Agarose extracted from seaweeds is used in\_\_\_\_\_\_\_\_\_**

(a) Spectrophotometry

(b) Tissue culture

(c) PCR

(d) Gel electrophoresis

**Answer: D**

**65. Bacillus thuringiensis forms protein crystals which contain insecticidal protein. This protein\_\_\_\_\_\_\_\_\_\_**

(a) Binds with epithelial cells of midgut of the insect pest ultimately killing it

(b) Is coded by several genes including the gene cry

(c) Is activated by acid pH of the foregut of the insect pest

(d) Does not kill the carrier bacterium, which is itself resistance to its toxin

**Answer: A**

**66. Which one of the following is now being commercially produced by biotechnological procedures\_\_\_\_\_\_\_\_\_**

(a) Nicotine

(b) Quinine

(c) Morphine

(d) Insulin

**Answer: D**

**67. Some of the characteristics of Bt cotton are\_\_\_\_\_\_\_\_\_**

(a) Long fibre and resistance to aphids

(b) Medium yield, long fibre and resistance to beetle pests

(c) High yield and production of toxic protein crystals which kill dipteran pests

(d) High yield and resistance to bollworms

**Answer: C**

**68. A new variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to\_\_\_\_\_\_\_\_\_**

(a) Lerma Rajo

(b) Co-667

(c) Sharbati sonora

(d) Basmati

**Answer: D**

**69. Who gave the definition of Biotechnology?**

(a) The European Federation of Biotechnology (EFB)

(b) National Center for Biotechnology Information (NCBI)

(c) National Institutes of Health (NIH)

(d) National Centre for Cell Science (NCCS)

**Answer : A**

**70. The first transgenic plant to be produced is\_\_\_\_\_\_\_\_\_\_**

(a) Brinjal

(b) Tobacco

(c) Rice

(d) Cotton

**Answer : B**

**71. \_\_\_\_\_ is a product of biotechnology.**

(a) Bacteria

(b) Skin

(c) Vaccine

(d) Plants

**Answer: C**

**72. Which bacterium is used in the production of insulin by genetic engineering?**

(a) Saccharomyces

(b) Rhizobium

(c) Escherichia

(d) Mycobacterium

**Answer: C**

**73. Bacteria protect themselves from viruses by fragmenting viral DNA with\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Ligase

(b) Endonuclease

(c) Exonuclease

(d) Gyrase

**Answer : B**

**74. Klenow fragment is derived from\_\_\_\_\_\_\_\_\_\_\_**

(a) DNA Ligase

(b) DNA Pol-I

(c) DNA Pol-II

(d) Reverse Transcriptase

**Answer : B**

**75. Making multiple copies of the desired DNA template is called\_\_\_\_\_\_\_\_\_\_\_\_**

(a) cloning

(b) transferring

(c) r-DNA technology

(d) genetic engineering

**Answer: A**

**76. Southern blotting is\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Attachment of probes to DNA fragments

(b) Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet

(c) Comparison of DNA fragments to two sources

(d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane

**Answer: B**

**77. PCR technique was invented by\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) Karry Mullis

(b) Boyer

(c) Sanger

(d) Cohn

**Answer : A**

**78. Plasmids are used as cloning vectors for which of the following reasons?**

(a) Can be multiplied in culture

(b) Self-replication in bacterial cells

(c) Can be multiplied in laboratories with the help of enzymes

(d) Replicate freely outside bacterial cells

**Answer: B**

**79. RNA interference helps in**

(a) Cell proliferation

(b) Micropropagation

(c) Cell defence

(d) Cell differentiation

**Answer : C**

**80. ELISA is\_\_\_\_\_\_\_\_\_\_\_**

(a) Using radiolabelled second antibody

(b) Usage of RBCs

(c) Using complement-mediated cell lysis

(d) Addition of substrate that is converted into a coloured end product

**Answer: D**

**81. \_\_\_\_\_\_ organism’s plasmid was used for the construction of first recombinant DNA.**

(a) Cyanobacteria

(b) Bacillus subtilis

(c) Saccharomyces cerevisiae

(d) Salmonella typhimurium

**Answer: B**

**82. A transgenic plant is a\_\_\_\_\_\_\_\_\_\_**

(a) Plant with a gene from other plants

(b) Improved plant for a precise agronomic trait

(c) Mutated plant

(d) None of the above

**Answer: A**

**83. Biotechnologies consisting of the use of biological systems (bacteria) for the manufacture, transformation or degradation of molecules through enzymatic or fermentation processes for industrial purposes, are called\_\_\_\_\_\_\_\_\_\_\_**

(a) Yellow biotechnologies

(b) Blue biotechnologies

(c) Green biotechnologies

(d) White biotechnologies

**Answer : D**

**84. Choose the wrong statement\_\_\_\_\_\_\_\_\_\_\_\_**

(a) The time required to obtain a plant genetically is about 1 year.

(b) The Bt toxin kills maize larvae and their relatives.

(c) The first transgenic plant was produced in the laboratory in 1984.

(d) In transgenesis, the place of insertion of the transgene on the chromosome cannot be predicted in advance.

**Answer : A**

**85. Choose the wrong statement\_\_\_\_\_\_\_\_\_**

(a) Hybridization of DNA by a probe requires sequence similarity between the two components.

(b) The circular and linear DNAs, containing N restriction sites for a restriction enzyme, give, respectively, N and N + 1 fragments, once cut by this enzyme.

(c) Cloning of a recombinant DNA means the isolation of cell colonies containing the construct of the specific recombinant DNA.

(d) The EcoRI endonuclease, the cut of which on a circular DNA gives 4 fragments, is in favor of the presence of 4 restriction sites.

**Answer: A**

**86. The first step in cloning a gene is\_\_\_\_\_\_\_\_\_\_\_**

(a) Isolation of DNA from an organism carrying the gene of interest.

(b) Cell culture on agarInsertion of a plasmid into a bacterium.

(c) Treatment of plasmids with restriction enzymes.

(d) All of these

**Answer: A**

**87. In biological macromolecules, the term 'domain' describes\_\_\_\_\_\_\_\_\_\_\_**

(a) an RNA region located between 5 'and 3' regions untranslated into proteins.

(b) structurally and functionally distinct regions of a protein.

(c) particular regions in the intracellular environment.

(d) a region of DNA located between two exons.

(d) Non of these

**Answer: B**

**88. The primary sequence of a protein cannot contain information concerning\_\_\_\_\_\_\_\_\_\_\_\_**

(a) its post-translational modifications and cell addressing

(b) its membrane topology

(c) its three-dimensional folding

(d) its transcription rate

**Answer: D**

**89. Mitochondrial proteins\_\_\_\_\_\_\_\_\_\_**

(a) are all synthesized in the cytoplasm and then imported into the mitochondria by crossing the pores of the outer membrane.

(b) exhibit an N-terminal sequence constituting the targeting signal to mitochondria and which is cleaved in the matrix by a peptidase signal.

(c) Both a and b

(d) None of the above

**Answer: B**

**90. Choose the wrong proposition concerning proteins and endoplasmic reticulum\_\_\_\_\_\_\_\_\_\_\_\_**

(a) the GPI anchor is added in the ER to proteins going to the plasma membrane

(b) during protein glycosylation, mannoses are added exclusively to the RE

(c) the addition of galactose to proteins is never done in the ER

(d) the secreted proteins pass through the lumen of the ER co-translatively

(e) the glycosylation of proteins on serine and threonine is initiated in the ER

**Answer: E**

**91. Choose the wrong proposition concerning the glycosylation of proteins\_\_\_\_\_\_\_\_\_\_\_\_\_**

(a) during N-glycosylation, N-acetylglucosamine is the sugar that immediately attaches to asparagine

(b) O-glycosylation of proteins is characterized by the direct addition of activated carbohydrate residues-linked to nucleotides

(c) the carbohydrate units involved in the glycosylation of proteins are associated with 4 amino acids of the protein; Asparagine, Serine, Threonine and Hydroxylysine

(d) glycosylation decreases protein solubility

**Answer: D**