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M.Sc. Semester-III (Biotechnology) (Old Course)

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Principle Paper BT 301 Genetic engineering and Bioinformatics

કુલ સમય :– : ૬૦ મીનીટ **કુલ પ્રશ્નો : ૫૦** **વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૩૫**

નોંધ : વિદ્યાર્થીએ માત્ર ૩૫ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૩૫ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

1. Who developed the chemical techniques to synthesize polynucleotides?
   (a) Barbara McClintock (b) James Watson (c) Fredrick Sanger (d) H. Gobind Khorana
2. Which of the following enzymes in bacteria are responsible for restricting the growth of viruses?
   (a) restriction endonuclease (b) topoisomerase (c) gyrase (d) protease
3. The first recombinant DNA molecule was synthesized in the year _____
   (a) 1962 (b) 1972 (c) 1982 (d) 1992
4. Recombinant plasmids are added to a bacterial culture that has been pretreated with _____ ions.
   (a) iodine (b) magnesium (c) calcium (d) ferric
5. EcoR1 exhibits a two-fold rotational symmetry.
   (a) True (b) False
6. Which bacterium is used in the production of insulin by genetic engineering?
   (a) Saccharomyces (b) Rhizobium (c) Escherichia (d) Mycobacterium
7. ——— is used as a vector for cloning into higher organisms
   (a) Retrovirus (b) Baculovirus (c) Salmonella typhimurium (d) Rhizopus nigricans
8. The expression of a transgene in the target tissue is identified by a
   (a) Transgene (b) Promoter (c) Enhancer (d) Reporter
9. Excision and insertion of a gene is called
   (a) Biotechnology (b) Genetic engineering (c) Cytogenetics (d) Gene therapy
10. It is required to distinguish between the cells that have taken up the vector and that have not. It is done by using _____
    (a) multiple cloning site (b) origin of replication (c) high copy number (d) selectable marker
11. Multiple cloning site (MCS) is defined as _____
    (a) site within the plasmid which contains a site for many restriction enzymes
    (b) site within the plasmid which contains a site for many restriction enzymes and they are not present anywhere else I n the plasmid
    (c) as the site containing many sites for only one restriction enzyme
    (d) cloning many inserts together
12. Which of the statement is true for pBR322?
    (a) It contains only an ampicillin resistance gene (b) It contains both ampicillin resistant and tetracycline resistant gene
    (c) The cloning site is present only in the ampicillin resistant gene (d) It is a natural vector
13. Which organism has the highest number of vectors?
    (a) Yeast (b) Mammalian cells (c) E.coli (d) Fungi
14. Which is an example of a simplest vector (in terms of size)?
    (a) 2 micron circle (b) Bacteriophage (c) Plasmid (d) YAC
15. Bolivar and Rodriguez constructed which vector?
    (a) Yip7 (b) R6-5 (c) pUC8 (d) Pbr322
16. How many sets of antibiotic resistance does the plasmid Pbr322 carry?
    (a) 1 (b) 3 (c) 2 (d) 4
17. Which selection system is used in the Puc8 plasmid?
    (a) Antibiotic selection (b) Lactose selection (c) Auxotrophic mutant selection (d) Plaque morphology selection
18. The size of M13 phage vector is _____
    (a) 3 kb (b) 6.4 kb (c) 15.4 kb (d) 20.4 kb
19. The M13mp2 consists _____ restriction site.
    (a) BamHI (b) AluI (c) PvuII (d) EcoRI
20. Introduction of DNA molecules into the recipient organism is termed as _____
    (a) transformation (b) translation (c) transduction (d) transcription
21. Which of the statements hold true for conjugation?
    (a) Conjugation is the natural process of transferring DNA from one species to another
    (b) It is the artificial process in case the cells are not able to take them up naturally
    (c) The plasmids are transferred from one cell to another by physical contact
    (d) The plasmids are transferred from one cell to another by chemical means
22. Viral infection can also be used to take up the DNA by the cells.
    (a) True (b) False
23. Electroporation is also used for taking up the DNA by the cells. It constitutes of _____
    (a) inserting the DNA into the cells via an electric shock
    (b) increased efficiency than both natural and chemical methods
    (c) causing the least amount of damage in comparison to other methods
    (d) decreased efficiency than both natural and chemical methods

24. The particle gun method consists of which of the following steps?
    (a) The DNA of interest is absorbed onto microprojectile beads
    (b) These beads are often made of aluminium
    (c) The explosion in a gun propels a macroprojectile forward which in turn propels microprojectile beads
    (d) The macroprojectiles and microprojectiles both cross the perforated plate and hit the target tissue behind it
25. The cell in which the F factor carries along with it some chromosomal genes are known as _____
    (a) F^+ cell (b) F^- cell (c) F' cell (d) F''' cell
26. The first genomic libraries were cloned in _____
    (a) Plasmid (b) Bacteria (c) Human (d) Plants
27. Genomic library construction is concerned with _____
    (a) Gene isolation (b) Protein production (c) Antibiotics (d) Regeneration
28. Which DNA is restricted to making a genomic library?
    (a) Genomic (b) Plasmid (c) Phage (d) Plant
29. A genomic library is a collection of _____
    (a) Genes (b) Proteins (c) Vectors (d) Recombinants
30. Lambda EMBL3 is a _____
    (a) Gene (b) Phage (c) Phage Vector (d) Protein
31. To avoid ligation of separate DNA fragments, which of the enzyme is used?
    (a) phosphatase (b) kinase (c) ligase (d) endonuclease
32. Libraries constructed in plasmid vectors can be kept as _____
    (a) plasmid containing cells (b) naked DNA
    (c) both plasmid containing cells and naked DNA (d) naked DNA is preferred over plasmid containing cells
33. What is the characteristic of the DNA that is used for the construction of library?
    (a) Naked DNA (b) Plasmid (c) Plasmid and naked DNA (d) Plasmid is preferred over naked DNA
34. Chain-termination is a type of _____
    (a) Sequencing (b) Vector generation (c) Antibiotic production (d) Gene manipulation
35. Which type of DNA cleavage is done in the Maxam Gilbert method?
    (a) Edge (b) Interstitial (c) Base-specific (d) Gene-specific
36. What is the main enzyme component of Sanger sequencing?
    (a) Helicase (b) Polymerase (c) Nuclease (d) Gyrase
37. The Klenow fragment is basically a _____
    (a) DNA hybrid (b) DNA polymerase (c) RNA polymerase (d) Promoter
38. Which of the following is not a benefit or a factual of FASTA over BLAST?
    (a) FASTA scans smaller window sizes (b) It gives more sensitive results
    (c) It gives less sensitive results (d) It gives results with a better coverage rate for homologs
39. Which of the following is not a benefit of BLAST?
    (a) Handling of gaps (b) Speed (c) More sensitive (d) Statistical rigor
40. FASTA is derived from logic of the dot plot.
    (a) True (b) False
41. When did Smith–Waterman first describe the algorithm for local alignment?
    (a) 1950 (b) 1970 (c) 1981 (d) 1925
42. The CLUSTALX provides a graphic interface.
    (a) True (b) False
43. Local alignments are more used when _____
    (a) There are totally similar and equal length sequences
    (b) Dissimilar sequences are suspected to contain regions of similarity
    (c) Similar sequence motif with larger sequence context
    (d) Partially similar, different length and conserved region containing sequences
44. Which of the following does not describe BLAST?
    (a) It stands for Basic Local Alignment Search Tool (b) It uses word matching like FASTA
    (c) It is one of the tools of the NCBI (d) Even if no words are similar, there is an alignment to be considered
45. Which of the following is the first and the most important step in the polymerase chain reaction?
    (a) Annealing (b) Primer extension (c) Denaturation (d) None of the above
46. For a protein search, which of the following is the wrong choice for fields?
    (a) Accession (number) (b) E. C. number (c) Issue (d) Journal number
47. The process of finding the relative location of genes on a chromosome is called _____.
    (a) Gene tracking (b) Genome walking (c) Genome mapping (d) Chromosome walking
48. Which of the following are not the application of bioinformatics?
    (a) Drug designing (b) Data storage and management
    (c) Understand the relationships between organisms (d) None of the above
49. The laboratory work using computers and computer-generated models generally offline is referred to as _____.
    (a) Insilico (b) Wet lab (c) Dry lab (d) All of the above
50. The databases Genbank, EMBL and DDBJ are updated daily.
    (a) True (b) False