

Duration : 3 Hrs

Maximum Marks : 75

- N.B. : 1. All questions are compulsory  
2. Figures to right indicate full marks

- Q. 1 Choose the appropriate option for following multiple choice based questions. 20M
1. How does ethical awareness contribute to responsible biotechnological practices
- a) It Reduce the cost of research
  - b) It Increase the use of toxic chemicals in environment
  - c) It increase the use of lab animals
  - d) It Will lead to rational genetic experimentation
2. What is the objective of enzyme immobilization?
- a) reducing the activity of the enzyme
  - b) degrading the enzyme at a faster rate
  - c) protecting and reusing the enzyme
  - d) deactivating the enzyme
3. The function of the Bioreceptor in a biosensor is
- a) used for the isolation of the bio analyte
  - b) Interact with analyte to produces some detectable physical change
  - c) used to display the signal
  - d) It converts the interaction between the analyte and the immobilized enzyme into a measurable signal
4. Single amino acid changes to increase the stability of enzymes is
- a) rDNA technology
  - b) Protein Engineering
  - c) Gene Therapy
  - d) RFLP

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5. Ammonium sulphate is used in enzyme production post fermentation process for
- a) Salting out/ precipitating out enzyme from fermentation media
  - b) As solvent in fermentation Media
  - c) As nutrient in the fermentation media
  - d) Dissolving enzyme in fermentation media
6. Restriction endonuclease are used as ----- in rDNA technology
- a) Molecular scissors
  - b) Molecular Glue
  - c) Both a and b
  - d) Either a or b
7. Technique for correcting defective genes responsible for disease development by introduction of genes into existing cells is
- a) Transgenic Animals
  - b) RFLP
  - c) Gene therapy
  - d) Mutation
8. Following is the chain terminator in Sanger's sequencing method
- a) Deoxynucleotide
  - b) Dideoxy nucleotide
  - c) Nucleotide
  - d) phosphate
9. Covishield vaccine is following types of vaccine
- a) Inactivated vaccine
  - b) Viral vector vaccine
  - c) Toxoid vaccine
  - d) Live attenuated vaccine
10. Extension temperature in PCR
- a) 4<sup>0</sup>C
  - b) 40<sup>0</sup>C

72°C

37°C

d)

11

Which of the following class of antibodies are of pentameric in structure

- a) IgA
- b) IgG
- c) IgM
- d) IgE

12.

IgG antibody produced in mother, cross placenta and protects fetus up to 6-month of age is \_\_\_\_\_ Immunity.

- a) natural passive
- b) artificial passive
- c) natural active
- d) artificial active

13.

Following hypersensitivity is mediated by T cells

- a) Type I
- b) Type II
- c) Type III
- d) Type IV

14.

Following precaution is necessary for vaccine containing aluminum-based adjuvants

- a) They should not be Frozen
- b) They should not be Stored in fridge
- c) They should be stored at room temperature
- d) They should be stored at 0°C

15.

Approximately following amount of blood is taken in one attendance while blood collection from blood donor

- a) 1000ml
- b) 800ml
- c) 450ml
- d) 700ml

16. -----involve modifying the structure of a chemical compound through Micro-organisms or enzymes, resulting in the production of molecules exhibiting higher polarity
- a) Genetic engineering
  - b) Biocatalyst
  - c) Biotransformation
  - d) Bioengineering
17. Genome Contains
- a) Functional DNA sequence
  - b) Non-Functional DNA sequence
  - c) Both functional and Non-functional DNA sequence
  - d) None of the above
18. -----is used for rapid screening and quantification of the presence of antigen in a sample.
- a) ELISA
  - b) Sanger's Method
  - c) Edman method
  - d) Northern Blotting
19. Pseudomonas denitrificans is used for the production of
- a) Citric acid
  - b) Vitamin B12
  - c) Glutamic acid
  - d) Penicillin
20. -----is Natural anticoagulant made by the mast cells of the connective tissue surrounded blood vessel
- a) Citrate
  - b) Heparin
  - c) ACD
  - d) None of the above

- Q. II Answer any two of the following (Any TWO) 20M
1. What are various techniques of enzyme immobilization? Elaborate on any three chemical methods of enzyme immobilization in detail. (10)
  2. Explain steps involved in rDNA technology. Define vector and with well labelled diagram elaborate on Plasmid and cosmid vector. (10)
  3. What are monoclonal antibodies? Explain production and application of monoclonal antibodies in detail. (10)
- Q. III Answer any seven of the following (Any SEVEN) 35M
1. Explain design of fermenter with well labelled diagram. Mention critical control parameters for fermentation process. (05)
  2. Enlist various blotting techniques? Explain western blotting along with its applications. (05)
  3. Give in detail process of production of amylase (05)
  4. Enlist the various ELISA tests and explain any one in detail. (05)
  5. Define Mutation? Explain various microbial Mutants. (05)
  6. What is protein engineering? Give applications of Protein engineering. (05)
  7. Draw and explain structure of MHC class I and II molecule. (05)
  8. Explain production of Penicillin by fermentation. (05)
  9. Give short note on collection and processing of whole human blood (05)