

Duration :3 Hrs

Maximum Marks : 75

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

**Q. I Choose the appropriate option for following multiple choice based questions. 20M**

1. The function of the transducer in a biosensor is
  - a) It is used for immobilization of the enzyme
  - b) It converts the interaction between the analyte and the immobilized enzyme into a measurable signal
  - c) used to display the signal
  - d) used for the isolation of the bioanalyte
2. Biotechnology at its core is about
  - a) understanding life and using this knowledge to benefit people
  - b) understanding life and using this knowledge to benefit the industry only
  - c) understanding life and using this knowledge to do only basic research
  - d) understanding life and using this knowledge to benefit citizens of only our country.
3. The correct flow chart of Biosensor is
  - a) Bioreceptor-Biosample-Transducer-signal processing-display
  - b) Transducer-signal processing-display-Biosample-Bioreceptor
  - c) Biosample-Bioreceptor-Transducer-signal processing-display
  - d) Display-signal processing-Biosample-Bioreceptor-Transducer-signal processing
4. An Enzyme is immobilized to.....
  - a) decrease its activity
  - b) stabilize it.
  - c) reduce the enzymatic reaction
  - d) denature it.

5. Ethics includes assessment of
  - a) the rights and wrongs of the specific technologies and applications
  - b) the right things of the specific technologies and applications
  - c) the wrong things of the specific technologies and applications
  - d) only theoretical aspects of the specific technologies and applications
6. Which of the following vector is obtained from a bacteria:
  - a) Cosmid
  - b) Plasmid
  - c) Phage lambda
  - d) Shuttle
7. Which of the following is incorrect
  - a) Therapeutic proteins can be obtained from microorganisms by recombinant DNA technique.
  - b) Weight of fish can be increased by using recombinant DNA technique
  - c) Vitamins can be obtained by using recombinant DNA technique
  - d) All the products obtained through recombinant DNA techniques are not safe for human health.
8. Vector is required in rDNA technology to
  - a) amplify the foreign gene
  - b) transfer a gene from animal to another
  - c) isolate the foreign gene
  - d) join the foreign gene
9. The denaturation temperature in the PCR is
  - a) 50<sup>0</sup>c
  - b) 40<sup>0</sup>c
  - c) 94<sup>0</sup>c
  - d) 37<sup>0</sup>c

10. The transgenic golden rice contains genes for
- vitamin A
  - vitamin D
  - vitamin C
  - vitamin E
11. Following is live attenuated viral vaccine
- Salk polio vaccine
  - Sabine polio vaccine
  - Diphtheria Vaccine
  - Tetanus Vaccine
12. MHC class I molecule binds to
- CD4 adhesion molecule of TH cells
  - CD8 adhesion molecule of Tc cells
  - CD4 adhesion molecule of Tc cells
  - CD8 adhesion molecule of TH cells
13. In antibody structure Two identical heavy chains and two identical light chains connected by
- Hydrogen bond
  - Disulfide Bond
  - Ionic bond
  - Covalent bond
14. \_\_\_\_\_ are added to vaccines to promote an immune response
- Stabilisers
  - Diluents
  - Adjuvants
  - Preservatives

15. Following component of the immune system is part of humoral immunity
- Natural killer cells
  - Basophills
  - Granulocytes
  - Antibodies
16. \_\_\_\_\_ technique is used in specific detection of DNA.
- Southern
  - Northern
  - Western
  - Eastern
17. \_\_\_\_\_ mutants will not grow when the essential metabolites (growth factor) are absent in culture media.
- Metabolic mutants
  - Auxotrophic mutants
  - Regulatory mutant
  - Cryptic mutant
18. \_\_\_\_\_ is the process in which viruses are used to transfer genetic material from one bacterium to another
- Transformation
  - Transduction
  - Conjugation
  - Transversion
19. Packed bed column is a \_\_\_\_\_ type of fermentor.
- Mechanically stirred
  - Forced convection
  - Pneumatic
  - Surface

20. Blackstrap molasses are used as a \_\_\_\_\_ in fermentation.
- a) Carbon source
  - b) Nitrogen source
  - c) Buffering agents
  - d) Antifoaming agent

**Q. II Long Answer Questions Any Two Out of three 20M**

- a) Describe protein engineering in detail. (10)
- b) Describe plasmid & cosmid cloning vectors in detail. (10)
- c) Define Monoclonal antibodies? Explain production of monoclonal antibodies using hybridoma technology. Give any two applications of monoclonal Antibodies. (10)

**Q. III Short Answer Questions (Answer Any Seven) 35M**

- a) Describe design of fermenter and enlist various controlling parameters with monitoring devices used in fermentation. (05)
- b) Write a note on Collection and processing of whole human blood. (05)
- c) Describe in detail production of Vitamin B12 by fermentation. (05)
- d) Enlist blotting techniques with their applications and Explain any one technique. (05)
- e) Write a short note on Microbial Biotransformation. (05)
- f) Define Mutation, explain types of microbial mutants. (05)
- g) Write a short note on hypersensitivity. (05)
- h) Explain the method of obtaining interferon by recombinant DNA technology (05)
- i) Explain the process of production of catalase enzyme by fermentation in detail. (05)