

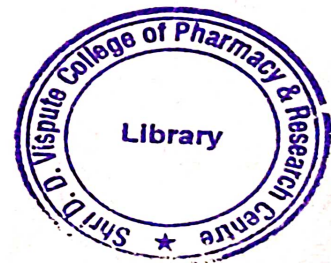
Duration :3 Hrs

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

- a) vitamin A
- b) vitamin D
- c) vitamin C
- d) vitamin E

11. Following is live attenuated viral vaccine

- a) Salk polio vaccine
- b) Sabine polio vaccine
- c) Diphtheria Vaccine
- d) Tetanus Vaccine

12. MHC class I molecule binds to

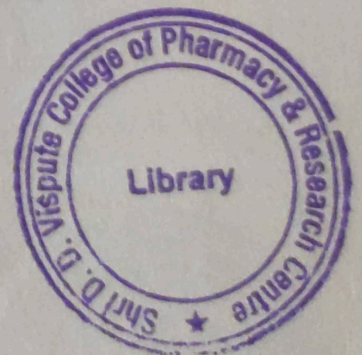
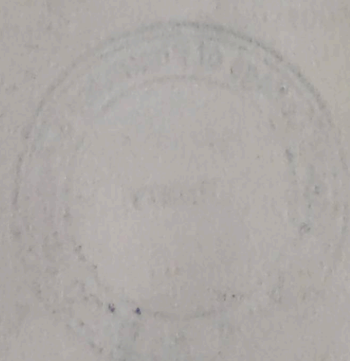
- a) CD4 adhesion molecule of TH cells
- b) CD8 adhesion molecule of Tc cells
- c) CD4 adhesion molecule of Tc cells
- d) CD8 adhesion molecule of TH cells

13. In antibody structure Two identical heavy chains and two identical light chains connected by

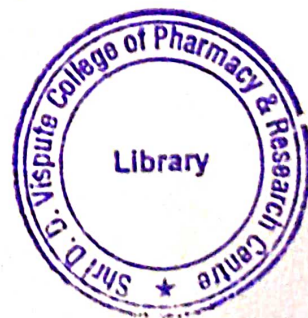
- a) Hydrogen bond
- b) Disulfide Bond
- c) Ionic bond
- d) Covalent bond

14. \_\_\_\_\_ are added to vaccines to promote an immune response

- a) Stabilisers
- b) Diluents
- c) Adjuvants
- d) Preservatives



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15. Following component of the immune system is part of humoral immunity

- a) Natural killer cells
- b) Basophils
- c) Granulocytes
- d) Antibodies

16. \_\_\_\_\_ technique is used in specific detection of DNA.

- a) Southern
- b) Northern
- c) Western
- d) Eastern

17. \_\_\_\_\_ mutants will not grow when the essential metabolites (growth factor) are absent in culture media.

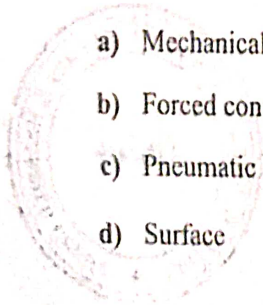
- a) Metabolic mutants
- b) Auxotrophic mutants
- c) Regulatory mutant
- d) Cryptic mutant

18. \_\_\_\_\_ is the process in which viruses are used to transfer genetic material from one bacterium to another

- a) Transformation
- b) Transduction
- c) Conjugation
- d) Transversion

19. Packed bed column is a \_\_\_\_\_ type of fermentor.

- a) Mechanically stirred
- b) Forced convection
- c) Pneumatic
- d) 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)

