Sample Question Paper I

1. Name two human diseases caused by the absence of a protein? (1)

2. If a scientist is given a 200 Kb fragments of DNA to clone which vector will he prefer to use? (2)

3. What is sparging? (1)

4. Define "Subculturing". (1)

5. Which property of the plant cell is exploited to culture plant cells? (1)

6. Give four advantages of Aqueous Two-Phase Partition Chromatography. (2)

7. What is a Homologene? (1)

8. A scientist needs to cut a DNA containing the palindromic sequence of GATC. Will he use a restriction endonulcease or DNase and why? (2)

9. Why are antifoaming agents added in the microbiological cultures? (2)

10. Give a few methods of concentration of protein. (3)

11. Explain how embryo rescue can be used to produce novel hybrids. (3)

12. Name two important products from animal cell culture technology. What are their functions? (2)

13. How does the treatment with CaCl2 increase the competence levels of bacteria? (2)

14. Suggest two methods of preserving microbial strains. (2)

15. What do you mean by term "Genomics"? (2)

16. Indicate one application of site-directed mutagenesis. (2)

17. What are the conventions adopted by the Database personnel to store nucleic acid data and protein sequence data with regard to the direction of the sequence? What is the basis of the convention? (3)

18. A single E. Coli cell produces 10 molecules of a protein called repressor which has a molecular weight of 50,000 daltons. If the shape of the E. Coli cell resembles a cylinder of diameter 1 micrometer and height 2 micrometer, Calculate the number of E. Coli cells required as starting material to purify 1 g of the repressor if the purification yield is only 70%. (3)

19. What is direct gene transfer? What are the methods of direct gene transfer? (5)

20. Write a short note on protein based product. (5)

21. Define the following: (a) Plasmid, (b) Restriction site, (c) Transformation, (d) Mutation, (e) Transfection (5)

22. How can we use microbial cultures for the production of metabolites? (3)

23. What is the possible benefit of embryonic stem cell technology? (3)

24. What are the various measures taken to ensure protein stability during purification? (3)

25. Write a short note on the bioethics in animal Genetic engineering. (5)