

**NOTE:**

1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labeled diagrams wherever necessary.
4. For Q 2, Q 3 and Q 4 attempt A and B OR C and D.

**Q 1 Do as directed (Any fifteen)**

15

1. Molecular weight of hemoglobin is \_\_\_\_\_.
2. \_\_\_\_\_ are enzyme proteins containing metal ions which are directly bound to the protein or to enzyme-bound non protein components.
3. Name the enzyme catalyzes the decomposition of hydrogen peroxide to water and oxygen.
4. What mineral is needed for wound healing?
5. When a and b have added to the C=C double bond of the substrate from the same side is a \_\_\_\_\_ addition
6. Define Enzymes.
7. The macroelements are required in amounts \_\_\_\_\_ than 100 mg/day.
8. Give one example of Cation Exchanger.
9. In fixed-angle rotors, the sample tubes are held fixed at the angle of the rotor cavity. (True / False)
10. The separation of nucleic acids in a CsCl gradient is an example of Isopycnic separation. (True / False)
11. State the function of the Elution buffer.
12. Give an example of a density gradient solution used for separation of biomolecules.
13. Give an ONE property of a ligand used in Affinity chromatography.
14. Cation exchangers possess negatively charged groups. (True / False)
15. Which 2 key steps are involved in running a 2D gel electrophoresis experiment?
16. Define Gel Documentation.
17. Which stain is commonly used to visualize proteins on an SDS-PAGE gel?
18. \_\_\_\_\_ is the migration of charged particles or molecules in a medium under the influence of an applied electric field.
19. What is the purpose of  $\beta$ -mercaptoethanol in SDS-PAGE?
20. Filter paper as a stabilizing medium is very popular for the study of normal and abnormal plasma proteins. (True / False)

- Q. 2 A Explain the Difference between Hemoglobin and Myoglobin. 08
- Q. 2 B What is an addition reaction? Explain its types. 07
- OR
- Q. 2 C What are Microminerals? Explain in detail any 3 Microminerals. 08
- Q. 2 D What is the role of catalase enzyme? Explain its Application. 07
- Q. 3 A Give an account on principle and applications of Ion exchange chromatography. 08
- Q. 3 B Elaborate on working and applications of differential centrifugation. 07
- OR
- Q. 3 C Explain the principle and applications of Size exclusion chromatography. 08
- Q. 3 D Derive the equation of Relative Centrifugal Force. 07
- Q. 4 A Explain Agarose Gel Electrophoresis and it's applications . 08
- Q. 4 B Explain the difference between AGE and SDS PAGE . 07
- OR
- Q. 4 C Explain Paper electrophoresis with a suitable diagram . 08
- Q. 4 D What are the factors which can affect electrophoretic mobility ? 07
- Q 5 Write Short notes on **any three** of the following 15
- a. Carboxypeptidase
  - b. Heme Group
  - c. Rate zonal centrifugation.
  - d. Applications of Electrophoresis
  - e. Migration of ions in an applied electric field