

Telangana University
Department of Biotechnology
Question Bank – Internal Assessment - I

Semester-II Paper-IV BIOSTATISTICS AND BIOPHYSICAL TECHNIQUES

1.What type of interaction happens in Affinity chromatography between a protein and a ligand?

- a) Covalent
- b) Noncovalent**
- c) Ionic
- d) Ionic + covalent interaction

2.Affinity chromatography is a _____

- a) Liquid – Liquid chromatography
- b) Gas-Liquid chromatography
- c) Solid – Gas chromatography
- d) Solid-liquid chromatography**

3.Where ligands are used in an affinity chromatography?

- a) Ligands are immobilized onto the column**
- b) Ligands are immobilized onto the protein
- c) Ligands are not used at all
- d) Ligands used as an eluents

4.What is the chemical property of the matrix used in an affinity chromatography?

- a) Ionic
- b) Inert**
- c) Acidic
- d) Basic

5.Which of the following chromatography technique is extremely specific in terms of separation?

- a) Ion exchange
- b) Thin layer chromatography
- c) Affinity chromatography**
- d) Gel filtration

6.What type of interaction found between matrix (can be agarose) and ligand in an affinity chromatography?

- a) Mixed interaction
- b) Ionic
- c) Noncovalent
- d) Covalent**

7.Which technique separates charged particles using electric field?

- a) Hydrolysis
- b) Electrophoresis**
- c) Protein synthesis
- d) Protein denaturing

8. Electrophoresis was developed by:

- a) Tswett
- b) Tsvedberg
- c) Tiselius**
- d) Sanger

9. If proteins are separated according to their electrophoretic mobility then the type of electrophoresis is:

- a) SDS PAGE**
- b) Affinity Electrophoresis
- c) Electro focusing
- d) Free flow electrophoresis

10. Which of the following is the principle of chromatography?

- A) Crystallization
- B) Differential migration of solutes**
- C) Evaporation
- D) Precipitation

11. In Thin Layer Chromatography (TLC), the stationary phase is usually made of:

- A) Silica gel or alumina**
- B) Paper
- C) Liquid solvent
- D) Gas

12. In Gas Chromatography (GC), the mobile phase is:

- A) Liquid
- B) Gas**
- C) Solid
- D) None of the above

13. High-Performance Liquid Chromatography (HPLC) is preferred over traditional liquid chromatography because:

- A) It uses larger particles for separation
- B) It has lower resolution
- C) It allows faster and more efficient separation**
- D) It does not require a pump

14. The term "R_f value" in chromatography refers to:

- A) The distance traveled by the solvent
- B) The distance traveled by the sample divided by the distance traveled by the solvent**
- C) The ratio of stationary to mobile phase
- D) The retention time of a compound

15. In ion-exchange chromatography, separation is based on:

- A) Molecular size
- B) Charge differences**
- C) Solubility
- D) Adsorption

16. Which detector is commonly used in Gas Chromatography (GC)?

- A) UV-Visible detector
- B) Flame Ionization Detector (FID)**
- C) Conductivity detector
- D) Refractive index detector

17. Which chromatography technique is best for separating proteins?

- A) Paper chromatography
- B) Gas chromatography
- C) Size-exclusion chromatography**
- D) Thin-layer chromatography

18. In Reverse Phase HPLC, the stationary phase is:

- A) Hydrophilic
- B) Hydrophobic**
- C) Neutral
- D) Charged

19. The term "retention time" in chromatography refers to:

- A) The time taken by the solvent to pass through the column
- B) The time a compound takes to travel from the injector to the detector**
- C) The time taken by a solute to dissolve in the mobile phase
- D) The time taken by the detector to identify the sample

20. In which chromatography stationary phase is more polar than mobile phase?

- A. Ion exchange chromatography
- B. Normal phase chromatography**
- C. Reversed chromatography
- D. Size exclusion chromatography

21. In thin layer chromatography, the stationary phase is made of _____ and the mobile phase is made of _____

- A. Solid, liquid**

- B. Liquid, liquid
- C. Liquid, gas
- D. Solid, gas

22. Ion exchange chromatography is based on?

- A. Electrostatic attraction
- B. Electrical mobility of ionic species
- C. Partition chromatography
- D. Adsorption chromatography

23. Which of the following is used as a carrier gas in gas chromatography?

- A. Carbon dioxide
- B. Oxygen
- C. Helium
- D. Methane

24. In reverse phase HPLC, there is a

- A. Non-polar solvent/polar column
- B. Polar solvent/Non-polar column
- C. Polar solvent/Polar column
- D. Non-polar solvent/Non-polar column

25. In a chromatographic separation, which of the following is most appropriate for the qualitative analysis of a substance?

- A. Taking factor
- B. Capacity factor
- C. Retention time
- D. Resolution

26. In size exclusion chromatography, solute molecules are separated based on _____

- A. Molecular geometry and size
- B. Molecular composition
- C. Molecular phase
- D. Molecular formula

27. In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under pressure?

- A. Column chromatography
- B. Planar chromatography
- C. Liquid chromatography
- D. Gas chromatography

28. What is the stationary phase in TLC?

- A) Liquid

- B) Gas
- C) Solid**
- D) Mobile phase

29. What is the commonly used stationary phase in TLC?

- A) Silica gel**
- B) Water
- C) Chloroform
- D) Methanol

30. What is the main principle behind TLC?

- A) Ion exchange
- B) Partition
- C) Adsorption**
- D) Diffusion

31. The R_f value is defined as:

- A) Distance moved by solvent front / Distance moved by compound
- B) Distance moved by compound / Distance moved by solvent front**
- C) Distance moved by solute / Time taken
- D) Distance moved by solvent / Time taken

32. Ion exchange chromatography does not depend on which of the following property?

- a) pH
- b) Salt concentration
- c) Buffer
- d) Molecular weight of the protein**

33. Basic column in ion exchange chromatography is used as a _____

- a) cation exchanger
- b) anion exchanger**
- c) neutral exchanger
- d) both cation and anion exchanger

34. Which of the following cannot be used for the separation of nucleic acids?

- a) SDS – PAGE**
- b) PAGE
- c) Northern blotting
- d) PAGE

35. Electrophoresis cannot be used to separate _____

- a) DNA
- b) RNA
- c) Amino acid**

d) Protein

36. Which of the following is not a character of polyacrylamide gel?

- a) Inert
- b) Ionic strength
- c) Stable over a wide range of pH
- d) Separate upto a few 100 bp of DNA

37. Which of the following is used as a stationary phase in paper chromatography?

- a) Silica gel
- b) Alumina
- c) Cellulose
- d) Zirconium Oxide

38. In _____ paper chromatography, sample travels from the center to the periphery of the paper.

- a) two dimensional
- b) radial
- c) ascending
- d) descending

39. Paper chromatography separates molecules based on which property?

- a) Molecular weight
- b) Polarity
- c) Viscosity
- d) Shape

40. What type of compounds are best suited for GC-MS analysis?

- (a) Non-volatile compounds
- (b) Polar compounds
- (c) Volatile or semi-volatile compounds
- (d) Ionic compounds