

**M.Sc. I Semester Degree Examination, April/May - 2024****BIOTECHNOLOGY****Instrumentation & Biotechniques****(NEP)**

Time : 1 Hour

Maximum Marks : 30

1. Chromatography that involves the separation of isomers :  
(A) Thin layer chromatography (B) Count current chromatography  
(C) Chiral chromatography (D) Affinity chromatography
2. Ion exchange chromatography is based on the \_\_\_\_\_.  
(A) Electrostatic attraction (B) Electrical mobility of ionic species  
(C) Partition chromatography (D) All of the above
3. In-gel permeation chromatography, \_\_\_\_\_ is eluated first from the column.  
(A) Cations (B) Anions  
(C) Bigger molecules (D) Smaller molecules
4. Chromatography is a physical method that is used to separate and analyse \_\_\_\_\_.  
(A) Simple mixtures (B) Complex mixtures  
(C) Viscous mixtures (D) Metals
5. pH of 0.1M NaCl solution is \_\_\_\_\_.  
(A) 7.0 (B) 7.5 (C) 8.0 (D) 0
6. In gas Chromatography, the basis for separation of components of the volatile material is the difference in \_\_\_\_\_.  
(A) Partition Coefficients (B) Conductivity  
(C) Molecular Weight (D) Molarity
7. Ammonium sulphate is a :  
(A) Acidic Salt (B) Basic Salt  
(C) Neutral Salt (D) Complex Salt
8. Range of pH scale is :  
(A) 7 to 14 (B) 0 to 7 (C) 0 to 14 (D) 7 to 17



9. Which of the following is used as a carrier gas in gas chromatography \_\_\_\_\_.
- (A) Carbon dioxide      (B) Oxygen      (C) Helium      (D) Methane
10. When more and more water is added to acid, the concentration of H<sup>+</sup> ion will \_\_\_\_\_.
- (A) Increase      (B) Decrease  
(C) Remain same      (D) Depend upon type of acid
11. In chromatography, the stationary phase can be \_\_\_\_\_ supported on a solid.
- (A) Solid or liquid      (B) Liquid or gas  
(C) Solid only      (D) Liquid only
12. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed ?
- (A) Eyepiece lens      (B) Objective lens  
(C) Condenser lens      (D) Magnifying lens
13. Which of the following cannot be used as an adsorbent in Column adsorption Chromatography ?
- (A) Magnesium oxide      (B) Silica gel  
(C) Activated alumina      (D) Potassium permanganate
14. Beer Lambert's law gives the relation between which of the following ?
- (A) Reflected radiation and concentration  
(B) Scattered radiation and concentration  
(C) Energy absorption and concentration  
(D) Energy absorption and reflected radiation
15. Resolving power of a microscope is a function of \_\_\_\_\_.
- (A) Wavelength of light used  
(B) Numerical aperture of lens system  
(C) Refractive index  
(D) Wavelength of light used and numerical aperture of lens system
16. Beer's law states that the intensity of light decrease with respect to \_\_\_\_\_.
- (A) Concentration      (B) Distance  
(C) Composition      (D) Volume
17. Which part of the light microscope controls the intensity of light entering the viewing area ?
- (A) Coarse adjustment screw  
(B) Fine adjustment screw  
(C) Diaphragm  
(D) Condenser lens



18. The representation of Beer Lambert's law is given as  $A = abc$ . If 'b' represents distance, 'c' represents concentration and 'A' represents absorption, what does 'a' represent ?
- (A) Intensity (B) Transmittance  
(C) Absorptivity (D) Admittance
19. Which type of microscope is especially useful for viewing thick structures such as biofilms ?
- (A) A transmission electron microscope  
(B) a scanning electron microscope  
(C) a phase-contrast microscope  
(D) a confocal scanning laser microscope
20. Which technique separates charged particles using electric field ?
- (A) Hydrolysis (B) Electrophoresis  
(C) Protein synthesis (D) Protein denaturing
21. Electrophoresis was developed by :
- (A) Tswett (B) Tsvedberg (C) Tiselius (D) Sanger
22. Which of the following statements is true about migration of biomolecules ?
- (A) The rate of migration is directly proportional to the resistance of medium  
(B) Rate of migration is directly proportional to current  
(C) Low voltage is used for separation of high mass molecules  
(D) Rate of migration is inversely proportional to current
23. Which of the following factors does not influence electrophoretic mobility ?
- (A) Molecular weight (B) Shape of molecule  
(C) Size of molecule (D) Stereochemistry of molecule
24. When is electrophoresis not used ?
- (A) Separation of proteins (B) Separation of amino acids  
(C) Separation of Lipids (D) Separation of nucleic acids
25. Serum protein polymorphism is demonstrated by :
- (A) HPLC (B) Centrifugation  
(C) GC-MS (D) Electrophoresis
26. In an SDS-PAGE :
- (A) Proteins are denatured by SDS  
(B) Proteins have the same charge to - mass ratio  
(C) Smaller proteins migrate more rapidly  
(D) All of the above



- 27.** How are the cells sorted ?
- (A) By dilution plating until there is only single cell in each well of microtitre plate.
  - (B) By the differential weight.
  - (C) By electrostatic force.
  - (D) By magnetic force.
- 28.** Which fluorescent dye can be used for red fluorescence ?
- (A) Rhodamine
  - (B) Fluorescein
  - (C) Carmine
  - (D) DAPI
- 29.** In Agarose gel electrophoresis, DNA will not migrate towards :
- (A) Cathode or positive electrode
  - (B) Cathode or negative electrode
  - (C) Anode or negative electrode
  - (D) Anode or positive electrode
- 30.** The most common type of gel used for separation of oligonucleotides is :
- (A) Starch gel Electrophoresis
  - (B) Urea-Polyacrylamide gel electrophoresis
  - (C) Agarose
  - (D) All of the above

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