

III. Short answers (Answer seven out of nine questions)

5x7=35

1. What are spectrophotometric titrations. Describe its instrumentation with neat and labelled diagram. 1+4=5
2. Explain the various factors that affect separation during ion exchange chromatography. 5
3. What is Beer-Lambert law? Mention the limitations of Beer-Lambert law. 2+3=5
4. Write a note on theory and applications of affinity chromatography. 5
5. Describe the various factors affecting the scattering of light. 5
6. Explain the process of electroosmotic flow in capillary electrophoresis (Give diagram). 5
7. Describe the instrumentation of flame photometer along with neat and labelled diagram. 5
8. Discuss the principle of atomic absorption spectroscopy. 5
9. Enumerate the detectors used in IR spectroscopy & describe any two in detail. 5

★★★

2023/SEM/ODD/BP-701T/008

UG Odd Semester (CBCS) Examination, March 2023

PHARMACEUTICAL SCIENCES**(7th Semester)****Course No: BP 701T****(Instrumental Methods of Analysis-Theory)**

Full Marks: 75

Time: 3 Hours

*The figures in the margin indicate full marks for the questions***I (A). Multiple choice questions 1x10=10**

1. The energies required for the following transitions in increasing order:
 (A) $n \rightarrow \pi^*$ (B) $\sigma \rightarrow \sigma^*$ (C) $n \rightarrow \sigma^*$ (D) $\pi \rightarrow \pi^*$
 i) $A < D < C < B$ ii) $D < C < B < A$
 iii) $A < B < C < D$ iv) $B < D < C < A$
2. Cross-linked dextran having porous 3D structure are specifically used in
 (a) Affinity chromatography
 (b) Molecular Sieve chromatography
 (c) Gel electrophoresis
 (d) Ion exchange chromatography
3. Which of the following flame is used for analyzing refractory elements?
 (a) Oxygen-hydrogen
 (b) Air-acetylene
 (c) Nitrous oxide-acetylene
 (d) Air-propane

(Turn Over)

4. SDS-PAGE is a technique widely used in the separation of
 - (a) Carbohydrates
 - (b) Lipids
 - (c) Proteins
 - (d) Nucleic acid
5. Which of the following is used for the determination of high concentration suspension?
 - (a) Refractometry
 - (b) Nephelometry
 - (c) Turbidimetry
 - (d) Both (b) and (c)
6. Immobilized metal ion affinity chromatography is based on the specific coordinate covalent bond between metals and
 - (a) Alanine
 - (b) Histidine
 - (c) Glycine
 - (d) Histamine
7. Amine shows characteristic N-H stretch at
 - (a) 3650 - 3200 cm⁻¹
 - (b) 3500 - 3300 cm⁻¹
 - (c) 3000 - 3300 cm⁻¹
 - (d) None of the above
8. For better chromatographic separations in gas chromatography, barbiturates are derivatized with the aid of
 - (a) Tripropylammonium hydroxide
 - (b) Trimethylanilinium hydroxide
 - (c) Triethylanilinium hydroxide
 - (d) Triethylammonium hydroxide
9. Quantum yield of highly fluorescent substances is
 - (a) 0
 - (b) Near to 1

- (c) Less than 1
 - (d) None of the above
10. For increased flexibility, capillaries used in capillary electrophoresis are coated with a polymer
 - (a) Polystyrene-Isoprene
 - (b) Polyacrylamide
 - (c) Polyimide
 - (d) Polyisoprene

I (B). Objective type (Answer the following in brief)

2x5=10

1. Define chromophore and auxochrome with examples.
2. What is the total number of theoretical plates if the HETP is 0.7 mm and the length of the packed column is 15 cm?
3. Mention the functions of nebulizer in atomic absorption spectrometer.
4. Write a note on the Nernst glow.
5. Mention two detectors used in HPLC.

II. Long answers (Answer two out of three questions)

10x2=20

1. Describe the factors affecting fluorescence intensity.
2. Discuss the theory, instrumentation (including detectors) and applications of gas chromatography. Give necessary diagram.
3. Explain the principle, development technique (give necessary diagrams) and application of column adsorption chromatography.