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BP 701 T

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2023

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B.Pharm. 7th Semester End-Term Examination (Regular)

INSTRUMENTAL METHODS OF ANALYSIS

Full Marks – 75

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Multiple Choice Questions (MCQ): (20 × 1 = 20)

Answer all questions

- (i) All of the following are the components of FTIR, except
- (a) Fixer minor (b) Moving mirror
(c) Grating (d) Beam splitter
- (ii) Which of the following analytical techniques is also known as colour writing?
- (a) NMR (b) Mass spectroscopy
(c) Chromatography (d) All of these
- (iii) Which of the following is the disadvantage of hydrogen, when used as carrier gas in gas chromatography?
- (a) Dangerous to use (b) Reduced sensitivity
(c) High density (d) Expensive
- (iv) Which of the following is not a limitation of Beer Lambert's law, which gives the relation between absorption, thickness, and concentration?
- (a) Radiation must have higher bandwidth
(b) Concentration must be lower
(c) Radiation source must be monochromatic
(d) Doesn't consider factors other than thickness & concentration that affect absorbance

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- (v) Which sentence is true about Nephelometry?
- (a) Intensity of the light and concentration graph is linear
 - (b) It is not used in analysis of the colloidal systems
 - (c) Wavelength is more important
 - (d) It is less sensitive
- (vi) Which of the following is the most preferred buffer condition for agarose gel electrophoresis?
- (a) Buffer of pH 4
 - (b) Buffer of pH 5
 - (c) Buffer of pH 7
 - (d) Buffer of pH 9
- (vii) The purpose of secondary filter in fluorescence spectroscopy is to
- (a) allow only excitation radiation
 - (b) allow only emission radiation
 - (c) allow both excitation/emission radiations
 - (d) allow transmitted radiation
- (viii) Releasing agents are used in atomic emission spectroscopy to prevent
- (a) Cationic interference
 - (b) Anionic interference
 - (c) Both anionic and cationic
 - (d) Physical interference
- (ix) R_f value in paper chromatography depends on
- (a) solvents used
 - (b) paper used
 - (c) nature of mixture
 - (d) all of these
- (x) In Flame photometry, Flame color's intensity tells us about
- (a) how much of the element present
 - (b) number of compound present
 - (c) complex structure of compound
 - (d) none of the above
- (xi) Tailing in HPLC can be eliminated by
- (a) reducing pH of the mobile phase
 - (b) adding suitable buffer to mobile phase
 - (c) decreasing the injection volume
 - (d) any of the above

- (xii) The chosen filter in colorimetry is ————— the colour of the solution being tested.
- (a) complementary to (b) same colour as
(c) darker than (d) brighter than
- (xiii) Thin layer chromatography is a type of
- (a) Ion exchange chromatography
(b) Partition chromatography
(c) Adsorption chromatography
(d) Gel chromatography
- (xiv) In HPLC, gradient elution involves
- (a) changing the column temperature
(b) using same mobile phase composition
(c) changing the mobile phase composition
(d) successive injection of sample
- (xv) The absorbed wavelengths in atomic absorption spectrum appear as
- (a) dark background (b) dark lines
(c) light background (d) light lines
- (xvi) Ion exchange capacity of a resin is dependent on
- (a) the total molecular weight of the resin
(b) length of the ion exchange resin
(c) solubility of the ion exchange resins
(d) the total number of ion active groups
- (xvii) The fluorescence intensity increases with all of the following except
- (a) Rigidity
(b) No. of rings
(c) Viscosity
(d) Dissolved oxygen
- (xviii) Derivatisation of a sample is carried out to
- (a) reduce polarity of the analytes
(b) increase volatility of the analytes
(c) increase the detector response
(d) all of the above

- (xix) Chromatogram is
- (a) Solute concentration vs Elution volume
 - (b) Solute concentration vs Elution time
 - (c) Both (a) and (b)
 - (d) None of the above
- (xx) A Diffraction grating is made up of
- (a) a glass
 - (b) a quartz
 - (c) alkali halides
 - (d) any of these

2. Answer any *seven* questions: (7 × 5 = 35)

- (a) Write the applications of IR spectroscopy in the field of Pharmacy.
- (b) Discuss various parts of filter fluorimeters briefly.
- (c) What is solvent degassing in HPLC? Describe different methods available for this purpose. Name one drug suitable for assay by each Normal and Reverse phase chromatography. (1+3+1=5)
- (d) Discuss the factors governing the efficiency of Ion Exchange chromatography.
- (e) Write a note on thin layer chromatography.
- (f) Discuss how Diffraction grating works in UV-Spectrophotometer.
- (g) Write the methodology and applications of paper chromatography.
- (h) Write the advantages of Gel permeation chromatography over the traditional column chromatography.
- (i) Describe in detail the Beer and Lambert's Law.

3. Answer the following questions: (Any two) (2 × 10 = 20)

- (a) Write in detail about stationary phase and packing techniques used in column adsorption chromatography. Describe the factors that may largely affect the column efficiency under this chromatography. (4+3+3=10)
- (b) Write in details the detectors used in uv visible spectroscopy.
- (c) What are the requirements of an ideal detector to be added in a Gas chromatograph? (3+7=10)