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2021

B.Pharm. 7th Semester (Regular) Examination

INSTRUMENTAL METHODS OF ANALYSIS (THEORY)

(New Regulation)

(w.e.f. 2017-18)

Full Marks – 75

Time – Three hours

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

A. Answer all questions :

(20 × 1 = 20)

1. (i) The cathode used in Atomic Absorption Spectroscopy is _____
 - (a) Sodium
 - (b) Based on the element
 - (c) Tungsten wire
 - (d) Silver wire
- (ii) Silica gel is stable at pH:
 - (a) 1-5
 - (b) 6-9
 - (c) 2-7
 - (d) None of these
- (iii) The following principle applicable in UV is _____
 - (a) Molecular vibration
 - (b) Molecular rotation
 - (c) Electronic transition
 - (d) Inner shell transition
- (iv) Thermocouple and Thermopile detectors are composed of _____
 - (a) Bismuth and antimony
 - (b) Wheatstone bridge
 - (c) Oxides of Mn, Co and Ni
 - (d) Twin dielectric flake

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- (v) Which of the following is an example of strong basic anion exchange resin?
- (a) Dolomite
 - (b) Phenol formaldehyde
 - (c) Quarternary ammonium compounds
 - (d) Sulphonated polystyrene
- (vi) In Flame Photometry Barium emits _____ colour under visualisation.
- (a) Brick red
 - (b) Orange
 - (c) Lime green
 - (d) Violet
- (vii) In TLC, fluorescent indicator is _____
- (a) Zinc stearate
 - (b) Zinc sulphate
 - (c) Zinc silicate
 - (d) None of these
- (viii) Electron capture detector used in GC is composed of _____
- (a) Selenium
 - (b) Oxides of Mn, Co and Ni
 - (c) Germanium
 - (d) All of the above
- (ix) The diameter of analytical column used in HPLC is _____
- (a) 2-4.5 mm
 - (b) 50-60 mm
 - (c) 0.25-0.35 mm
 - (d) 5-6 mm
- (x) The common reagent for detecting barbiturates in TLC is _____
- (a) Aniline phthalate
 - (b) Mercuric nitrate
 - (c) Diphenyl carbazone
 - (d) Antimony trichloride
- (xi) The following reagent is used in Gel electrophoresis for protein separation?
- (a) Comassie blue
 - (b) Methylene blue
 - (c) Alizarin
 - (d) Catechol-violet
- (xii) The most popular thickness of layer in TLC is:
- (a) 0.5 mm
 - (b) 0.75 mm
 - (c) 0.25 mm
 - (d) 2 mm
- (xiii) In reverse phase chromatography mobile phase is _____
- (a) Polar
 - (b) Either (a) or (c)
 - (c) Non polar
 - (d) None of the above
- (xiv) Weakly acidic cation exchange resins are useful in pH range of:
- (a) 1-14
 - (b) 1-12
 - (c) 5-14
 - (d) 1-9

- (xv) _____ converts sample in mist or aerosol.
- (a) Nebulizer (b) Atomizer
(c) Detector (d) None of the above.
- (xvi) Fluorescence quenching technique is used to detect that absorb at _____
- (a) 280nm (b) 214 nm
(c) 254nm (d) 275 nm
- (xvii) The cross-linking agent in ion exchange resin is _____
- (a) TEAE (b) Divinyl benzene
(c) DEAE (d) Dolomite
- (xviii) _____ is used as stationary liquid phase for non polar solutes in GLC.
- (a) Squalene (b) Benzene
(c) Polyethylene glycol (d) Celite
- (xix) Example of non polar stationary phase is _____
- (a) ODS (b) Untreated silica
(c) PEG (d) CMC
- (xx) Katharometer is _____
- (a) HPLC detector (b) ESR
(c) GC detector (d) HPTLC

B. Answer any seven

(7 × 5 = 35)

1. With a neat diagram write the working of Photomultiplier tube.
2. Elaborate the interferences of Flame photometry.
3. Write a note on Nepheloturbidometry.
4. What is Electrophoresis? Write the factors affecting Electrophoretic mobility. (2+3=5)
5. What is R_f value? Write some advantages and disadvantages of TLC. (1+4=5)
6. Explain the mechanism of ion exchange in ion exchange chromatography. Mention the factors affecting ion exchange. (2+3=5)
7. Write a short note on Atomic Absorption Spectroscopy.
8. Write a note on working of bolometer.
9. Explain the different vibrations in IR spectroscopy.

C. Answer any two

(2 × 10 = 20)

1. Define Chromophore and Auxochrome with suitable examples. Explain the different electronic transitions of UV Visible spectroscopy. With diagram explain the working of a double beam UV-Visible spectrophotometer. (2+4+4=10)
2. With Jablonski diagram explain the principle of Fluorescence and Phosphorescence. Mention the factors affecting fluorescence. (4+6=10)
3. Write the principle of HPLC. Write diagram explain different parts and working of an HPLC instrument. (3+7=10)