

SARDAR PATEL UNIVERSITY
B.Sc. (IV Semester) Examination
2016

Tuesday, 12th April
10.30 am - 12.30 pm

US04ECHE06 - Instrumental Methods of Analysis

Total Marks : 70

Q-1 Multiple Choice Questions.

10

- 1 What is Quinhydrone?
 (a) Equimolar quinone and hydroquinone (b) Equimolar quisol and hydroquisol
 (c) Both a & b (d) None of these
- 2 The relation between molecular conductance (μ_v) & specific conductance (k) is
 (a) $\mu_v = v/k$ (b) $\mu_v = v k$ (c) $k = \mu k$ (d) None of above
- 3 Antimony electrode can be used in the pH range of
 (a) 4 to 8 (b) 10 to 8 (c) 3 to 6 (d) 4 to 12
- 4 The formula of R_M is
 (a) $\text{Log}(1/R_F - 1)$ (b) $\text{Log}(R_F - 1)$ (c) Both 1 & 2 (d) None of these
- 5 Value of R_F depends upon
 (a) Solvent used (b) Temperature (c) Nature of mixture (d) All of above
- 6 _____ stationary phase & _____ mobile phase used in paper chromatography.
 (a) Solid, liquid (b) Liquid, gas (c) Liquid, liquid (d) Gas-gas
- 7 The diameter & length of column in HPLC is....
 (a) 1 to 4 mm & 20-50 cm (b) 5 to 7 mm & 30-40 cm
 (c) 8 to 9 mm & 20-30 cm (d) 8 to 11 mm & 30-40 cm
- 8 The full form of DTCD is...
 (a) Differential transition conductivity detector (b) Differential thermal conduction detector
 (c) Differential thermal conductivity detector (d) None of these
- 9 Visible wavelength of light is...
 (a) 4000-8000 A° (b) 8000-12000 A° (c) 2000-4000 A° (d) All of these
- 10 The total energy of molecule is given by ...
 (a) $E_{\text{vib}} + E_{\text{rot}} + E_{\text{ele}}$ (b) $E_{\text{vib}} - E_{\text{rot}} - E_{\text{ele}}$ (c) $E_{\text{rot}} - E_{\text{vib}} + E_{\text{ele}}$ (d) none of these

Q-2 Answer the following in short. (ANY TEN)

20

- 1 Explain the method of cell constant determination.
- 2 Explain effect of dilution.
- 3 Define: Equivalent Conductance and Molecular conductance.
- 4 Discuss factors effecting column efficiency.
- 5 Discuss on adsorbent used in thin layer chromatography.
- 6 Write limitations and scope of TLC.
- 7 Name the detectors used in Gas Chromatography.
- 8 Write the advantages of gas chromatography.
- 9 List out the requirements of a good temperature programming device.
- 10 'The characteristic band of $n \rightarrow \pi^*$ in the pyridine generally disappears in acidic solution.' - Explain.
- 11 Explain the dilution method in short.
- 12 List out the advantages of double beam instrument.

- Q-3**
 (a) Write a note on: Glass Electrode. 05
 (b) Explain conductivity cell with suitable diagram. 05

OR

- Q-3**
 (a) Discuss the applications of conductometric measurements. 05
 (b) Discuss advantages of potentiometric titration. 05

- Q-4**
 (a) Explain principle of column chromatography with suitable diagrams. 05
 (b) Discuss different types of paper chromatography. 05

OR

- Q-4**
 (a) Write a note on: Thin Layer Chromatography. 05
 (b) Discuss quantitative analysis in Paper Chromatography. 05

- Q-5**
 (a) Give a brief account on Gas Chromatography. 10

OR

- Q-5**
 (a) Explain High Performance Liquid Chromatography. 10

- Q-6**
 (a) Discuss on: Visual Comparators. 05
 (b) Write short note on: Detectors in spectrophotometer. 05

OR

- Q-6**
 (a) Discuss Lambert's – Beer's Law and discuss the factors affecting deviation from the Beer's law. 05
 (b) Explain filters used in Colorimeter. 05

ALL THE BEST