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**SARDAR PATEL UNIVERSITY**  
**B.Sc. EXAMINATION Fourth Semester (CBCS)**  
**US04EICH02 Instrumental Methods of Analysis**

Date: 12-04-16, Tuesday

Time: 10.30 to 12.30pm

Maximum Marks: 70

**Q-1 Multiple Choice Questions.**

10

- 1 Which of the following equation is correct?  
(a)  $pH = -\log[H^+]$  (b)  $pH = \ln[H^+]$  (c)  $pH = [H^+]^2$  (d)  $pH = -[H^+]$
- 2 Which type of metal is used in hydrogen electrode?  
(a) Reactive (b) Highly reactive (c) Inert (d) Alkaline
- 3 Dilution effect is seen on the \_\_\_\_\_.  
(a) Conductance (b) Specific conductance (c) Equivalent & molecular conductance (d) All of these
- 4 If solid stationary phase & liquid mobile phase is used in the chromatography then the method is known as \_\_\_\_\_.  
(a) Column (b) Thin layer (c) HPLC (d) All of above
- 5  $R_M, R_F, R_X$  are called \_\_\_\_\_.  
(a) Migration parameters (b) Travelling agent (c) Both a & b (d) None of these
- 6 The pressure used normally range from \_\_\_\_\_ to \_\_\_\_\_ in HPLC.  
(a) 20 to 200 atm (b) 30 to 300 atm (c) 30 to 200 atm (d) None of these
- 7 The type of mobile phase used in HPLC separation depends on ....  
(a) Type of sample (b) Type of stationary phase (c) Both a & b (d) none of these
- 8 In gas chromatography the mobile phase used is gas but stationary phase....  
(a) Solid & Liquid (b) Liquid & Gas (c) Solid, Liquid, Gas (d) None of these
- 9 The wave length in ultra-violet range is ...  
(a) 4000-8000  $\text{Å}^\circ$  (b) 8000-12000  $\text{Å}^\circ$  (c) 2000-4000  $\text{Å}^\circ$  (d) None of these
- 10 Which of the following transition has maximum energy level?  
(a)  $\pi \rightarrow \pi^*$  (b)  $n \rightarrow \sigma^*$  (c)  $\sigma \rightarrow \sigma^*$  (d) none of these

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

20

- 1 Write advantage & disadvantage of hydrogen electrode.
- 2 Express the reaction between equivalent conductance & specific conductance.
- 3 Discuss specific resistance and specific conductance.
- 4 Discuss factors effecting column efficiency.
- 5 Write the names of detectors for identification of compound.
- 6 Write limitations and scope of TLC.
- 7 Name different detectors used in Gas Chromatography.
- 8 Discuss principle of Gas Chromatography.
- 9 Name main Components of HPLC instrument.
- 10 Saturated hydrocarbons can serve as the best solvent for UV measurements.
- 11 Explain on the source used in visible spectrophotometer.
- 12 Explain the types of electrons in organic molecule.

- Q-3**
- (a) Write short note on: Quinhydrone Electrode. 05
- (b) Discuss how acid-base titration is carried out with conductance measurements. 05

**OR**

- Q-3**
- (a) Write a note on: Antimony Electrode. 05
- (b) Discuss how redox titration and precipitation titration are carried out with potential measurements. 05

- Q-4**
- (a) Discuss the types of paper chromatography with suitable diagram. 05
- (b) Discuss how thin layer chromatography is superior over other chromatographic methods. 05

**OR**

- Q-4**
- (a) Write a short note on Column Chromatography. 05
- (b) Explain the methods by which thin layer is prepared in TLC. 05

- Q-5**
- (a) Write a brief note on Gas Chromatography. 05

**OR**

- Q-5**
- (a) Write a brief note on: High performance Liquid Chromatography. 05

- Q-6**
- (a) Write short note on: Filters and Monochromators. 05
- (b) Explain on: Double Beam Spectrophotometer. 05

**OR**

- Q-6**
- (a) Write Short note on: Photomultiplier Tube. 05
- (b) State Lambert-Beer's Law and discuss the factors due to which deviation from Beer's Law is observed. 05

**ALL THE BEST**