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M PHARM**(SEM I) THEORY EXAMINATION 2017-18****MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES****Time: 3 Hours****Total Marks: 75****Note: 1. Attempt all Sections. Assume any missing data if any.****SECTION A****1. Attempt all questions in brief. 10 x 2 = 20**

- a. Define Beer Lambert equation.
- b. What is chromophore? How they are different from auxochromes?
- c. Differentiate between stretching and bending.
- d. How FT-IR different from dispersive IR.
- e. Explain the splitting of signals pattern in ¹H NMR.
- f. How partition chromatography different from adsorption chromatography?
- g. Define electrophoresis with suitable example.
- h. What are the different types of paper chromatography?
- i. What do you mean by HETP?
- j. How shielding effect different from deshielding effect.

SECTION B**2. Attempt any two of the following: 2 x 10 = 20**

- a. Discuss the detail description of principle, theory, instrumentation and application of HPLC.
- b. What is the different method thermal analysis? Explain the instrumentation and pharmaceutical application of DSC.
- c. Explain why
 - i) Amines absorb at high wavelength in comparison to alcohol in UV.
 - ii) Reverse phase chromatography is more commonly used in analysis of drugs and pharmaceuticals.
 - iii) Mass is not obtained for sugars using EI source but it can be obtained in FAB.
 - iv) $\sigma\text{-}\sigma^*$ transition has highest energy than $\pi\text{-}\pi^*$ transition.
 - v) Volatility and thermostability are two important criteria for Gas chromatography.

SECTION C**3. Attempt any seven parts of the following: 7 x 5 = 35**

- a. Give principle, theory and instrumentation of UV/Visible spectroscopy.
- b. Discuss the various interferences used in flame spectroscopy.
- c. Give the proper NMR signal in following compounds
 - i) Propanol
 - ii) Acetic acid
 - iii) Aspirin
 - iv) Paracetamol.
- d. What are immunological assays? And discuss the differences between RIA and ELISA.
- e. Discuss the principle, instrumentation and application of potentiometry.
- f. Write a short note on 2-D NMR.
- g. Discuss the different types of ionization technique in mass spectroscopy.
- h. What is electrophoresis? And discuss their types.
- i. Differentiate between gel and ion exchange chromatography.