

QP Code: 101350

Reg No: .....

First Year M.Pharm Degree Examinations (Supplementary)- November 2012

**Modern Analytical and Research Methods**

(Common for all branches)

Time: 3 hrs

Maximum Marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays:

(2x20 =40)

1. Discuss the types of ions produced in a mass spectrometer. Explain meta-stable ions. What is Maclafferty rearrangement of fragmented ions in mass spectroscopy. Add a note on the importance of isotopes in mass spectroscopy.
2. Discuss about the packed and capillary columns used in gas chromatographic analysis. Explain with diagrams the working principle of the following gas chromatographic detectors • Flame ionization detector (FID) • Thermal conductivity detector (TCD) • Nitrogen-phosphorous detector (NPD)

Short Essays:

(6x10=60)

3. What are the different types of detectors used in UV-Vis spectrophotometer and explain the working principle of a photomultiplier tube.
4. Explain why  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^{19}\text{F}$  and  $^{31}\text{P}$  are the most important nuclei in nuclear magnetic resonance (NMR) experiments
5. What is high performance thin layer chromatography (HPTLC). Describe the advantages of HPTLC over thin layer chromatography.
6. What is statistical error and what are the reasons for experimental errors. Explain Random versus Systematic error
7. Describe the working principle of an X-ray powder diffraction instrument and its applications in pharmaceutical analysis.
8. Classify chromophores and explain the types of chromophores in UV spectroscopy. What is a bathochromic shift and its effects on UV wavelength. When does a hypsochromic shift occur in UV spectroscopic method and what is the effect of solvent on such a shift.

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