**QP Code: 101350** **Reg No: ……**

**First Year M.Pharm Degree Supplementary Examinations November 2015**

## 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 fundamental principles of nuclear magnetic resonance (NMR) spectroscopy. Explain in detail about chemical shift and the factors affecting it

2. Explain the principle, instrumentation and application of high performance liquid chromatography (HPLC) with a neat diagram. Add a note on one applications of HPLC in pharmacy and advantages of HPLC over gas chromatography (GC).

**Short Essays:** **(6x10=60)**

3. Discuss the instrumentation and applications of fluorimeter in pharmacy.

4. Explain the principle involved in mass spectroscopy. List the different type of ions formed during ionization. Add a note on meta stable ions.

5. Explain analysis of variance, student T-test, correlation and regression.

6. Explain the principle involved in IR spectroscopy. What are the conditions for a molecule to be studied by IR spectroscopy. How will you differentiate the aldehyde, ketone and carboxylic acids by IR absorption bands.

7. State Beer's and Lambert's law. Derive on expression relating absorbance, concentration and path length.

8. Describe the principle, instrumentation and applications of X-ray powder diffraction technique.

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