



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI - 600 034**

**DEGREE EXAMINATION - FOOD CHEMISTRY AND FOOD PROCESSING**

**FIRST SEMESTER - APRIL 2014**

**1808/1802 - ANALYTICAL AND INSTRUMENTATION TECHNIQUES**

Date : 04/04/2014

Dept. No.

Max. : 100 Marks

Time : 09:00-12:00

**Part A**

**Answer all the questions.**

10 x 2 = 20 marks

1. What is the role of interferometers in IR spectroscopy?
2. Define spin spin coupling in NMR spectroscopy.
3. What is the difference between flame photometer and atomic absorption spectroscopy?
4. Define Molarity
5. What is the function of monochromators in UV spectroscopy?
6. What is the significance of finger print region in IR spectroscopy?
7. Mention the applications of HPLC in food analysis.
8. List the possible packing material available to pack columns.
9. What is the advantage of using GC-MS when compared to GC.
10. Mention the applications of TLC. How HPTLC is advantageous when compared to TLC?

**Part B**

**Answer any eight questions.**

8 x 5=40 marks

11. Explain the working principle of pH meter with its calibration.
12. Describe the role of potentiometric titration in milk analysis.
13. Discuss the instrumentation of SFC (supercritical fluid chromatography).
14. You are comparing a more hydrogenated, more saturated, more solid like competitor's margarine with yours, which is less hydrogenated, more unsaturated, and more liquid like consistency. What two NMR techniques would you use to compare ( a ) solidity ( b ) degree of saturation? What are the basic principles involved in these measurements? Draw the expected results.
15. Derive Beer Lambert's law and give its verification.
16. What is the molarity of a solution made by dissolving 5 g of NaCl in 500 ml of water?
17. What is selection rule for IR spectroscopy?
18. Sketch a  $^1\text{H}$  NMR spectra of a) n- propanol and b) isopropanol
19. Explain any two types of detectors used in GC.
20. Explain the components of HPLC.
21. Discuss the following
  - Molecular ion (2.5 marks)
  - Isotopic peak (2.5 marks)

22. Explain the linkage isomers in coordination compounds for cyano and isocyano compounds.

**Part C**

**Answer any four questions.**

4 x 10=40 marks

23. Explain the principle and instrumentation of mass spectroscopy.
24. Explain the instrumentation and applications of FTIR (Fourier transform infrared ) spectroscopy.
25. Discuss the factors affecting chemical shift in NMR spectroscopy.
26. Explain the principle, instrumentation and applications of spectrofluorimeter.
27. Discuss the working of pH and Potentiometer. How are they considered significant in food analysis?
28. Enumerate the principal and instrumentation of AAS (Atomic absorption Spectroscopy).

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