LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **FOOD CHEMISTRY AND FOOD PROCESSING**

FIRST SEMESTER – **APRIL 2018**

FP 1808– ANALYTICAL AND INSTRUMENTATION TECHNIQUES

Date: 25-04-2018 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

Part A

Answer all the questions. 10 x 2 =20 marks

1. List the types of detectors in Gas Chromatography.
2. What is Coupling constant?
3. Define Chemical shift.
4. How many grams of solid NaOH are required to prepare 500ml of 0.04M solution? Express the concentration of this solution in terms of N, %W/V.
5. Differentiate absorption and emission spectra.
6. How does a mixture of a weak acid and its conjugate base help buffer a solution against pH changes?
7. Why TMS is used as a reference standard in NMR spectroscopy?
8. State nitrogen rule with an example.
9. How will you differentiate inter and intra molecular hydrogen bonding using IR spectroscopy?
10. Highlight the significance of Rf values obtained by TLC.

Part B

Answer any eight questions. 8x5=40 marks

11. State and explain Beer Lambert's Law.
12. Discuss the principle and applications of ^{13}C NMR spectroscopy.
13. What is meant by Mc Lafferty rearrangement? Explain with an example.
14. Describe the Column chromatography procedure.
15. Enumerate the principle of HPLC.
16. i) Correlate the relationship between absorbance and percentage transmission. (2.5)
    ii) What would be the absorbance of a solution which has a percentage transmission of
    a) 100% b) 50% c) 10% d) 0%? (2.5)
17. How will you differentiate geometrical isomers of organic compounds using IR spectroscopy?
18. Explain the purpose of graphite tube furnace in AAS.
19. Write a note on Monochromators in UV Visible spectroscopy.
20. What is Arsenate poisoning? Express 0.098 ppm of arsenate present in potable water in ppb.
21. Compare supercritical fluid chromatography and high performance liquid chromatography.
22. How many milliliters of 2N HCl would be needed to make 100 mL of 0.1 N HCl?

Part C

Answer any four questions. 4x 10=40 marks

23. Discuss the types of vibrations in IR spectroscopy.
24. Explain the principle and instrumentation of UV Visible spectrophotometer.
25. Describe the Principle and applications of Atomic absorption spectroscopy.
26. Write a detailed note on the following
    i) Applications of Gas chromatography in food analysis.—(5)
    ii) Potentiometric titration----(5)
27. a) Describe any three factors affecting chemical shift in NMR spectroscopy.
    b) How will you differentiate hydrogen bonding using NMR spectroscopy? (5+5)
28. a) Explain the working principle of pH meter. Highlight the purpose of buffer solutions.
    b) Write a note on molecular ion peak in mass spectroscopy. (6+4)

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