LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – PHYSICS

THIRD SEMESTER – NOVEMBER 2009

CH 3900 - INSTRUMENTAL ANALYSIS (FOR PHYSICS)

Date & Time: 12/11/2009 / 9:00 - 12:00 Dept. No. Max. : 100 Marks

PART A

Answer all the questions 10 x 2 = 20

1. How many ml of 0.2N H_2SO_4 will be required to neutralize 20 ml of 0.15N NaOH?
2. How much water should be added to 400 ml of N/10 H_2SO_4 to make it exactly N/15?
3. What is the principle of PCC?
4. Mention any two factors affecting R_f values.
5. State any two functions of the solvents in column chromatography.
6. Define isocratic elution.
7. Why HPLC is more versatile than GC?
8. What is acidic buffer? Give an example.
9. State Beer-Lambert's law.
10. What is the principle of DSC.

PART B

Answer any eight questions 8 x 5 = 40

11. Draw and explain the DTG curve of $CuSO_4.5H_2O$.
12. Write short notes on the chemical interferences in FES.
13. How is Pb^{2+} determined in petrol using AAS?
14. What are bending vibrations in IR? Explain their types.
15. What is FID? Explain its working principle.
16. Discuss the action of a cation exchanger.
17. Explain the different types of pumps used in solvent delivery system of HPLC.
18. Discuss the factors affecting the efficiency of the column in column chromatography.
19. How is Na^+ determined by FES?
20. Explain the fractional distillation process for the purification of liquids with an example.
21. How is pH of the basic buffer calculated by Henderson equation?
22. Explain the thermogram of $CaC_2O_4.H_2O$.

PART C

Answer any four questions 4 x 10 = 40

23. What are thermometric titrations? How are they carried out? Explain with an example.
24. Explain the working principle of double beam spectrophotometer.
25. What is the principle of AAS? Draw its instrumentation and explain.
26. Draw the block diagram and explain the principle of HPLC.
27. Briefly discuss the different types of columns used in GC.
28. Write short notes on the following:
    a) Preparation of thin layer on plates
    b) Location of compounds on TLC chromatogram.

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