STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2010–11)

SUBJECT CODE: CH/MC/AC34

B.Sc. DEGREE EXAMINATION, NOVEMBER 2011
BRANCH IV- CHEMISTRY
THIRD SEMESTER

REG.NO ……..

COURSE : MAJOR CORE
PAPER : ANALYTICAL CHEMISTRY
TIME : 30 MINUTES **MAX.MARKS : 30**

SECTION – A **(30x1=30)**

ANSWER ON THE QUESTION PAPER ITSELF:

I Choose the correct answer :

1. The number of significant figures in 12.3460
   a) 2 b) 4 c) 6 d) 3
2. The result of the arithmetical operation 60.3+1.05 – 0.162 expressed to the correct number of significant figure is
   a) 61.2 b) 61.188 c) 61.19 d) 61.20
3. Separation is based on the partition of the various components between the two liquid phases. The technique involved is
   a) Paper Chromatography b) TLC
   c) Column chromatography d) Ion-exchange chromatography
4. Before carrying out a polarographic analysis the solution to be analysed is flushed with a stream of
   a) oxygen b) nitrogen c) carbon dioxide d) chlorine
5. The DTA curve is a plot of
   a) ΔT versus T b) T versus W c) $\frac{dW}{dT}$ versus T d) W versus T
6. The relationship between the dipole moment and the strength of the applied field
   a) directly proportional b) inversely proportional
   c) independent d) none of the above answer

II State whether True or False :

7. All precise values are accurate.
8. The principle involved in column chromatography is adsorption.
9. The residual current in polarography is also known as capacitor current.
10. Phase transitions give rise to endotherms in DTA curves.
11. $\mu = 4.8 \times 10^{-8}$ csu.cm.
12. The most common method of purifying a liquid is its boiling point.

III Match the following:

13. Solvent polarity	a) constant errors
14. Determinate errors	b) thermocouple
15. Random errors	c) reference material
16. DTA apparatus	d) dielectric constant
17. Alumina	e) convection current
18. Density gradient	f) Accidental errors

..2

IV Fill in the blanks :

19. The error that can be presumably avoided or corrected are called _____.
20. _____ involves the boiling of an impure liquid at atmospheric pressure and condensing the vapours to obtain the pure liquid.
21. The units for the diffusion co-efficient of an ion are _____.
22. The curve height of the polarogram represents the _____ current.
23. Phase transitions give rise to _____ in DTA curves.
24. Isomers that are mirror images of each other are called _____.

V Answer in one or two lines:

25. Give the Ikovic equation.

26. What are paramagnetic substances.

27. Define Dipole moment.

28. What is meant by Confidence limit.

29. Define Distillation.

30. Before carrying out a polarographic analysis the solution to be analysed is flushed with stream of nitrogen gas, Why?

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TIME : 2½ HOURS **MAX.MARKS : 70**

SECTION – B **5X6=30**

Answer any five questions.

1. Calculate the mean deviation for the following five results.
   8.5, 9.5, 10.0, 10.5, 11.5
2. State the laws of colorimetry & explain the deviation from the law.
3. Mention the criteria of purity of organic solids & liquids.
4. Briefly discuss paper electrophoresis & its uses.
5. Explain the terms
   a) Concentration polarisation
   b) Limiting diffusion current
   c) Half-wave potential
6. Discuss the thermogram of calcium oxalate monohydrate.
7. Give an account of applications of magnetic moment.

SECTION – C **2X20=40**

Answer any two questions.

8. a) Illustrate the Gouy's method for measurement of magnetic susceptibilities.
   b) Describe the instrumentation of thermogravimetric analysis. (10+10)

9. a) Describe the electrode assembly used for polarographic analysis.
   b) What precautions are to be taken while obtaining a polarogram. (12+8)

10. Briefly explain the following techniques
    a) Vacuum distillation
    b) Column chromatography (10+10)

11. a) Define the terms Mean, Median & Average deviation.
    b) Distinguish precision from accuracy.
    c) What are errors? Classify them & explain the methods of minimizing them, (4+4+12)