B.Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER/NOVEMBER 2018

SEMESTER –1: CHEMISTRY (COMPLEMENTARY COURSE FOR PHYSICS/BOTANY/ZOOLOGY)

COURSE: **U1CPCHE1: BASIC THEORETICAL AND ANALYTICAL CHEMISTRY**

(For supplementary - 2014 admission)

Time: Three Hours   Max. Marks: 60

PART A

*Answer **all** questions. Each question carries **1** mark*

1. At equilibrium ΔG = …………
2. Precipitation occurs only when ionic product exceeds ………
3. What is the condition for spontaneity with respect to ΔG value?
4. Give an example for a redox indicator.
5. From which element Hund's rule of maximum multiplicity starts?
6. Define Lewis acid.
7. Give an example of a substance used as primary standard.
8. What is the pH of 0.01M HCl solution?   (1 x 8 = 8)

PART B

*Answer **any six** questions. Each question carries **2** marks*

9. Water acts as a Bronsted acid as well as a Bronsted base. Illustrate with an example.
10. Distinguish between accuracy and precision.
11. What is Heisenberg's uncertainty Principle?
12. Mention any four characteristics of entropy.
13. Predict the sign of ΔS in the following processes: (a) Dissolution of glucose in water
    (b) HCl added to $AgNO_3$ solution to form AgCl precipitate.
14. Define Rf value. What is its significance?
15. State and explain Aufbau principle.
16. Briefly explain Third law of thermodynamics.   (2 x 6 = 12)

PART C

*Answer **any four** questions. Each question carries **5** marks*

17. What are redox titrations? Give examples.
18. The solubility product of silver chloride is 1.2 X 10^{-10} at 298K. Calculate the solubility of
    AgCl at 298K.
19. Write a note on de Broglie's wave theory of particles.
20. Discuss the theory and principle of titrations.
21. Explain quantum numbers.
22. What are the common errors in quantitative analysis? Suggest methods to minimize them.

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PART D

*Answer **any two** questions. Each question carries **10** marks*

23. (a) Briefly discuss about the various separation techniques used in

   analytical chemistry   (6)

   (b) Sketch the shape of *s*, *p* and *d* orbitals   (4)

24. (a) What is solubility product? Explain its applications.   (5)

   (b) Compare Arrhenius, Lowry- Bronsted and Lewis concepts of acids and bases. (5)

25. (a) Discuss the various enthalpies of Fusion, Vapourisation and Sublimation with examples. (5)

   (b) Explain (i) Molarity   (ii) Molality   (iii) Normality   (5)

26. Write short notes on

   a) Gas chromatography   (5)

   b) Ion exchange chromatography   (5)

   (10 x 2 = 20)

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