

Reg. No.....

Name.....

B.Sc. DEGREE END SEMESTER EXAMINATION OCTOBER/NOVEMBER 2017**SEMESTER –1: CHEMISTRY (COMPLEMENTARY COURSE FOR PHYSICS/BOTANY/ZOOLOGY)****COURSE: 15U1PCHE1: GENERAL CHEMISTRY***(Common for Regular 2017 admission and Supplementary/Improvement 2016 & 2015 admission)*

Time: Three Hours

Max. Marks: 60

SECTION AAnswer **all** questions. Each question carries **1** mark.

1. Give the mathematical formulation for Heisenberg's uncertainty principle.
2. Represent the electronic configuration of N atom.
3. Give two examples for state function.
4. Define Ph.
5. Give two examples for Lewis base.
6. What is meant by precision?
7. What are indicators?
8. Define packing fraction. (1 × 8 = 8)

SECTION BAnswer **any six** questions. Each question carries **2** marks.

9. Derive de Broglie equation.
10. Calculate the normality of oxalic acid solution prepared by dissolving 1.26 g of pure Oxalic acid in 500 mL of distilled water.
11. State and explain first law of thermodynamics. Give its mathematical form.
12. Explain the term conjugate acid – base pair with suitable example.
13. What are the drawbacks of Bohr theory.
14. Define hydrolysis. Explain the hydrolysis of NH_4Cl .
15. Define magic number and explain its significance.
16. What is induced radioactivity explain with an example. (2 × 6 = 12)

SECTION CAnswer **any four** questions. Each question carries **5** marks.

17. Write a short note on conventional and breeder reactors.
18. What are buffer solutions? Explain the mechanism of action of a basic buffer.
19. Discuss briefly about redox titrations.
20. Explain the terms enthalpy, entropy and free energy. Explain the criteria for feasibility of a process in terms of change in free energy.

21. What are quantum numbers. Discuss briefly the significance of different types of quantum numbers?
22. What is meant by errors? Discuss in detail about different methods used for minimization of errors. (5 x 4 = 20)

SECTION D

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

23. Discuss briefly on
- (a) Carbon dating (3)
 - (b) Applications of nuclear chemistry in medicine, agriculture and industry (7)
24. (a) What are reversible and irreversible processes. State and explain second law of thermodynamics. Explain the criterion for reversible and irreversible process in terms of second law (7)
- (b) Enthalpy and entropy changes of a reaction are $42.63 \text{ KJ mol}^{-1}$ and $103 \text{ JK}^{-1}\text{mol}^{-1}$ respectively. Predict whether this process is spontaneous at 50°C (3)
25. (a) Write a short notes on (i) Paulis exclusion principle (ii) Afbau Principle (6)
- (iii) Hund's rule of maximum multiplicity (6)
- (b) Calculate frequency and wave length corresponding to the spectral line of lowest frequency in Lyman series in the spectra of hydrogen atom. Given $R = 1.09678 \times 10^{-7} \text{ m}^{-1}$, $C = 3 \times 10^8 \text{ ms}^{-1}$ (4)
26. (a) What is common ion effect? Explain its applications. (5)
- (b) Differentiate between primary standard and secondary standard. What are the criteria required for a primary standard? (5)
- (10 x 2 = 20)
