

**B.Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2022****SEMESTER – 1: CHEMISTRY (COMPLEMENTARY FOR PHY./BOT/ZOO.)****COURSE: 15U1PCHE1: GENERAL CHEMISTRY***(Common for Supplementary 2018/2017/2016 /2015 admissions)*

Time: Three Hours

Max. Marks: 60

**SECTION A*****Answer 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. What is n/p ratio?.
4. What is entropy?
5. Give two examples for Lewis base.
6. Define system
7. The pH of 0.1M NaOH solution is \_\_\_\_\_.
8. The reproducibility of a measurement is known as \_\_\_\_\_. (1 × 8 = 8)

**SECTION B*****Answer 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. Write the Henderson equation.
12. What is absolute error?
13. What is photoelectric effect?
14. What is meant by dual nature of matter and radiation?
15. What are open, closed and isolated systems?
16. What is solubility product?

(2 × 6 = 12)**SECTION C*****Answer any four questions. Each question carries 5 marks.***

17. State and explain second law of thermodynamics.
18. What are buffer solutions? Explain the mechanism of action of a basic buffer.
19. What are the different types of error? Explain.
20. Describe conventional nuclear reactor.
21. Compare Arrhenius concept and Lewis concept of acids and bases.
22. What is meant by errors? Discuss in detail about different methods used for minimization of errors.

(5 × 4 = 20)

## SECTION D

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

23. (a) What is molarity and molality? Calculate the molarity of  $\text{Na}_2\text{CO}_3$  solution prepared by dissolving 1.06g of pure anhydrous  $\text{Na}_2\text{CO}_3$  in 500mL of distilled water (4)
- (b) Discuss the concept of Gibbs free energy. What is the effect of temperature on spontaneity of a reaction (6)
24. Discuss briefly on
- (a) Carbon dating (3)
- (b) Applications of nuclear chemistry in medicine, agriculture and industry (7)
25. (a) What are fertile and fissile isotopes? (3)
- (b) Explain postulates of Bohr theory (7)
26. (a) Discuss in detail about different types of titrations (6)
- (b) Explain common ion effect, write any one applications (4)

(10 × 2 = 20)