

B.Sc. DEGREE END SEMESTER EXAMINATION OCTOBER 2016
SEMESTER - 1: CORE COURSE

COURSE: 15U1RCHE1: THEORETICAL AND INORGANIC CHEMISTRY- I

Common for Regular (2016 Admission) & Supplementary / Improvement (2015 Admission)

Time: Three Hours

Max Marks: 60

SECTION A

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

1. ----- is an example of a secondary standard.
2. Give an example of a redox indicator.
3. The opposite of hypothesis is called.....
4. What is meant by scientific theory?
5. Isotones have same number of -----.
6. The concept of wave-particle duality was first proposed by.....
7. What is the oxidation number of chromium in CrO_5 ?
8. Normality calculation formula is -----? (1 × 8 = 8)

SECTION B

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

9. Explain significant figures.
10. Commercially available sulphuric acid sample is 15% H_2SO_4 by weight. (density = 1.10g/ml)
Calculate a. molarity b. molality
11. What is hypothesis? How does it differ from law?
12. Define the terms: mole fraction and ppm
13. What is Photoelectric effect?
14. What is Rydberg's equation?
15. What is Heisenberg's uncertainty principle?
16. What is meant by confidence limits? (2 × 6 = 12)

SECTION C

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

17. Explain the role of chemistry as central science connecting other branches of science.
18. The following results were obtained in the replicate determination of lead content of a blood sample.
0.752, 0.756, 0.752, 0.751 and 0.760 ppm of Pb.
Calculate the mean, standard deviation and coefficient of variation of this set of data.

19. Write a note on the essential features of Planck's quantum theory
20. Explain the principle of complexometric titrations with suitable examples.
21. What are the essential components of a research project?
22. Calculate the de Broglie's wave length of an electron travelling with a speed 20% that of light.
(Mass of electron = 9.1×10^{-31} Kg, $h=6.625 \times 10^{-34}$ kgm²sec⁻¹) (5 × 4 = 20)

SECTION D

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

23. Briefly explain the principle of redox titrations with the help of estimation of oxalic acid using potassium permanganate.
24. Comprehensively discuss various types of errors and methods to reduce them.
25. Discuss the Bohr atom model. Explain its merits and demerits
26. Explain the comprehensive use of Pauli's exclusion principle, Hund's rule of maximum multiplicity, Aufbau principle in writing electronic configuration of atoms using chlorine as example.
(10 × 2 = 20)
