FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2016
(Regular/Supplementary/Improvement)
(CUCBCSS-UG)
CC15UCHE1B01- THEORETICAL AND INORGANIC CHEMISTRY - I
(Chemistry - Core Course)
(2015 Admission Onwards)

Time: Three Hours   Maximum: 80 Marks

Section A (one word)
Answer **all** questions.   (Each question carries **1** mark)

1. A well substantiated explanation of a scientific hypothesis is called a -----.

2. 18g of water contains -----H_2O molecules.

3. The oxidation number of Mn in $KMnO_4$ is ----.

4. The active mechanism involved in its function of calcium chloride as a desiccant is -----.

5. The significant figure in the reported value 6.0061 is ----.

6. Erichrome Black -T is used as an indicator in --------- titration.

7. The phenomenon of photoelectric effect establishes the ----nature of light.

8. The energies of the radiation with wavelengths $8000A^0$ is ------.

9. The minimum amount of the target material required to sustain a fission chain reaction is

   called ----.

10. Np-239 decays by β emission to yield -----.   **(10 x 1 = 10)**

Section B (Short answer)
Answer **any 10** questions.   (Each question carries 2 marks)

11. Explain the term scientific concept.

12. Differentiate between molarity and molality.

13. Explain the term MSDS.

14. Distinguish between absolute error and relative error.

15. Calculate the momentum of a particle which has a de Broglie wavelength of 0.2 nm.

16. Differentiate between precision and accuracy.

17. Find out the H-α line of Balamer series of hydrogen spectrum.

18. Discuss the dual nature of electrons.

19. State Geiger- Nuttal rule.

20. Why neutrons are better particles for artificial transmutation than α- particle?

21. Explain the term packing fraction.

22. What are transuranic elements?

                                    (10 x 2 = 20)

Section C (Paragraph)
Answer any **five** questions.   (Each question carries **6** marks)

23. Differentiate between scientific theory and scientific law.

24. State and explain Heisenberg's uncertainty principle. What is its significance?

25. Briefly explain the term argentometry with suitable example.

26. What are the first aid treatment for a person who suffers skin contact and eye contact with phenol?

27. Calculate the mol fraction of a solute in 2.3 molal aqueous solution of urea.

28. Discuss Ostwald's theory of acid- base indicators

29. a)describe radio carbon dating technique.

b) An archaeological wooden sample shows a C-14 activity 2.8 disintegrations per minute per gram of carbon. Calculate the age of sample if a freshly cut sample of wood shows C-14 activity of 15.8 disintegrations per minute per gram of carbon. Half- life of C-14 is 5770 years.

30. Write short note on a) radioactive series   b) radioactive equilibrium

$(5 \times 6 = 30)$

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

31. Discuss briefly the components of a research project report.

32. a)What are metal ion indicators? Explain their function with a suitable example.

b) Explain the principle of iodimetric and iodometric titrations.

33. a) discuss the atomic spectrum of Hydrogen.

b) The threshold frequency of a metal is 4.412×10^{-14} s^{-1}. Calculate the kinetic energy of the photoelectron ejected when light of wavelength 4000A^0 falls on the surface of the metal. h = 6.626×10^{-34} J s.

34. a) Discuss the principle and salient features of nuclear reactors.

b) Explain with example how radio isotopes are useful in medical diagnosis and radiotherapy.

$(2 \times 10 = 20)$

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