

Reg. No.....

Name.....

**B.Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2019****SEMESTER – 1: CHEMISTRY (CORE COURSE)****COURSE: 15U1CRCHE1: THEORETICAL AND INORGANIC CHEMISTRY - I***(Common for Improvement 2018/ Supplementary 2018/2017/2016 /2015 admission)*

Time: Three Hours

Max. Marks: 60

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

1. Give an example of a primary standard.
2. Maximum number of electrons that can be accommodated in an orbit is .....
3. Why 4s orbital is filled before filling 3d orbital?
4. Photoelectric effect indicates ..... nature of electromagnetic radiation.
5. The number of significant figures in the number 52305.30 is .....
6. One mole of benzene contains ..... molecules of benzene.
7. The electronic configuration of chromium is .....
8. Give an example of a redox indicator.

 $(1 \times 8 = 8)$ **SECTION B***Answer any Six questions. Each question carries 2 marks*

9. What is coefficient of variation?
10. State Heisenberg's uncertainty principle.
11. Sketch the five d orbitals.
12. What is a hypothesis?
13. Why phenolphthalein is not used in the titration of strong acid against weak base?
14. What are the differences between accuracy and precision?
15. What are Hermitian operators?
16. How much volume of 5M HCl should be diluted with water to prepare 3 litre of 2M HCl?

 $(2 \times 6 = 12)$ **SECTION C***Answer any Four questions. Each question carries 5 marks*

17. Write a note on Alchemy.
18. Explain de Broglie's dual nature of matter.
19. Give the postulates of quantum mechanics.
20. Briefly explain Complexometric titrations.
21. Write a note on quantum numbers.
22. Calculate the mean, median, standard deviation and relative standard deviation for the measurements: 24.3, 27.8, 20.1, 25.0, 26.6 and 22.4.

 $(5 \times 4 = 20)$

**SECTION D**

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

23. Explain briefly the different types of errors and the methods of eliminating or minimizing errors.
24. Explain the theory behind acid-base titration. With the help of titration curves briefly explain the various types of acid –base titrations.
25. Derive the time independent Schrödinger wave equation and apply it to particle in a one dimensional box.
26. a) What are the postulates of Bohr atomic model b) Derive an expression to calculate the radius of the  $n^{\text{th}}$  orbit of hydrogen atom.

(10 × 2 = 20)

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