Reg. No..................................   Name: ....

BSC DEGREE END SEMESTER EXAMINATION - OCTOBER 2015

SEMESTER - 1: CORE COURSE IN CHEMISTRY

COURSE: 15U1CRCHE1: THEORETICAL AND INORGANIC CHEMISTRY

Time: Three Hours   Total Marks: 60

Section A

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

1. ------------ is the indicator used in EDTA titration of zinc
2. Give an example of a primary standard.
3. Possible explanation of some phenomena is called.............
4. Define law of multiple proportions.
5. Give any one property which cannot be explained by the wave nature of light.
6. The concept of wave-particle duality was first proposed by.............
7. Avogadro number is -------------
8. What is the designation for an orbital with $n = 5$ and $l = 3$?

$(8 \times 1 = 8)$

Section B

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

9. Explain the terms mean deviation and standard deviation.
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 a law?
12. Define the terms normality and mole fraction.
13. What is green chemistry? Mention its importance.
14. What are Hermitian operators?
15. What is positive correlation?
16. What is meant by confidence limits?

$(6 \times 2 = 12)$

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. Differentiate between precision and accuracy.
19. Explain the shapes of s, p and d orbitals.
20. What is Rutherford's atom model and explain its limitations.
21. An electron is confined in a one-dimensional box of length 4Å. Calculate the wavelength corresponds to a spectral transition between n = 1 and n= 2 levels. (Mass of electron = 9.1×10^{-31} Kg)
22. Write a note on the procedure adopted in writing science projects.

$(4 \times 5 = 20)$

Section D

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

23. Briefly explain the principle of acid– base titrations with the help of different titration curves.
24. Comprehensively discuss various types of errors. Discuss the methods to reduce them.
25. Derive the expressions for the radius of nth electron orbit in a hydrogen atom and the velocity and energy of an electron revolving in it.
26. State and explain the postulates of quantum mechanics.

$(2 \times 10 = 20)$

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