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

BSc DEGREE END SEMESTER EXAMINATION - OCTOBER 2015

SEMESTER - 1: COMPLEMENTARY COURSE IN BSc PHY./BOT./ZOO.

COURSE: 15U1CPCHE1: GENERAL CHEMISTRY

Time: Three Hours   Total Marks: 60

Section A

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

1. An electron is in 5f orbital. Give the n & l values.

2. The mathematical expression for uncertainty principle is _____.

3. The pH of 0.1M NaOH solution is _____.

4. State the third law of thermodynamics.

5. Give an example of fusion reaction.

6. How many alpha and beta particles are emitted when $_{84}Po^{218}$ disintegrates to $_{82}Pb^{206}$?

7. The reproducibility of a measurement is known as _____.

8. Give an example for an indicator used in acid-base titrations. $(1 \times 8 = 8)$

Section B

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

9. Write the Henderson equation.

10. What is free energy of a system? Give the mathematical expression for free energy.

11. What is relative error?

12. What is meant by dual nature of matter and radiation?

13. Give two points of differences between natural and induced radioactivity.

14. Define 'ionic product of water'. Derive the expression for ionic product of water

15. Define system. What are open, closed and isolated systems?

16. Graphically depict the shapes of d orbitals. Name the orbitals. $(2 \times 6 = 12)$

Section C

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

17. "The entropy of the universe is always increasing". Comment on this statement.

18. The amount of ^{14}C present in an old wooden pot from an excavation is found to be one-tenth that present in a fresh piece of wood. Calculate the age of the wooden pot.
    (Half-life of ^{14}C is 5770 years)

19. Explain the terms - weight percentage, normality, molarity, ppm and millimoles.

20. (a) What are the limitations to Bohr theory?

   (b) Explain Sommerfeld's extension to Bohr theory.

21. Compare Arrhenius concept and Lewis concept of acids and bases.

22. Give an example for a basic buffer. Discuss its buffer action.   (4 × 5 = 20)

Section D

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

23. (a) What are the methods for elimination and minimization of errors?   (4)

   (b) What are primary and secondary standards? Discuss the criteria for primary

      standards.   (6)

24. Explain the significance and application of solubility product and common ion effect in

   qualitative inorganic analysis.

25. (a) What are fertile and fissile isotopes?   (3)

   (b) Describe the conventional nuclear reactor.   (7)

26. State the following principles:

   (a) Aufbau principle   (2)

   (b) Hund's rule of maximum multiplicity   (2)

   (c) Pauli's exclusion principle   (2)

   (d) How do these three principles help in assigning the electronic configuration to

      atoms?   (4)

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