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

B.Sc. DEGREE END SEMESTER EXAMINATION OCTOBER 2016
SEMESTER - **1: COMPLEMENTARY COURSE IN PHY./BOT./ZOO.**
COURSE: **15U1CPCHE1: GENERAL CHEMISTRY**

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. An electron is in n=3, l=0, m=0. Identify the orbital.

2. Which principle states that the number of electrons in an orbital cannot be more than 2?

3. According to Lewis concept, a base is an electron pair _____.

4. A reaction is found to be in equilibrium, the value of ΔG is _____.

5. Give the equation for packing fraction.

6. What is induced radioactivity?

7. The normality of 6M sulphuric acid is _____.

8. Give an example for secondary standard.

$(1 \times 8 = 8)$

SECTION B

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

9.   What is a buffer solution? Give an example.

10. Calculate the entropy change for the vaporization of liquid water to steam at 100°C.

   $\Delta H_{vap} = 37.3$ kJ mol^{-1}.

11. What is absolute error?

12. Derive de Broglie relation.

13. Give two points of differences between nuclear fission and nuclear fusion reactions.

14. Explain the application of solubility product in soap industry.

15. How is a primary standard solution prepared?

16. State and give the expression for Heisenberg's uncertainty principle.

$(2 \times 6 = 12)$

SECTION C

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

17. State and explain second law of thermodynamics.

18. What is the principle of radiocarbon dating?

19. What are the different types of error? Explain.

20. Briefly discuss on the different types of quantum numbers.

21. Explain what is meant by K_a and K_b; pK_a and pK_b. Which is a better method of expressing the strength of an acid - K_a or pK_a?

22. Explain redox titration using a suitable example.

<div align="right">(5 × 4 = 20)</div>

SECTION D

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

23. (a) What is molarity and molality? Calculate the molarity of Na_2CO_3 solution prepared by dissolving 1.06g of pure anhydrous Na_2CO_3 in 500mL of distilled water   (4)

   (b) Discuss the concept of Gibbs free energy. What is the effect of temperature on spontaneity of a reaction   (6)

24. (a) What is common ion effect? Explain its applications   (7)

   (b) What is pH and pOH   (3)

25. (a) What do you mean by binding energy? How is it calculated?   (4)

   (b) What is a breeder reactor? Explain using an example.   (4)

   (c) Write a note on disposal of nuclear wastes   (2)

26. Write short notes on:

   (a) Quantization of angular momentum   (3)

   (b) Postulates of Bohr Theory   (5)

   (c) Origin of hydrogen spectrum   (2)

<div align="right">(10 × 2 = 20)</div>

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