FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS-UG)

CC15U CHE1 C01 - GENERAL CHEMISTRY

(Chemistry - Complementary Course)

(2016 to 2018 Admissions – Supplementary/Improvement)

Time: Three Hours   Maximum: 64 Marks

SECTION-A

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

1. What is the function of Haemoglobin?

2. The hybridisation of Iodine in IF_5 is ……….

3. For a 4f orbital the value of l is ……….

4. The product formed when $^{234}Th_{90}$ emits β particle is ……….

5. The conjugate base of CH_3COOH is ……….

6. The oxidation number of Cr in K_2CrO_4 is ……….

7. Eriochrome black T is an example of ………. indicator

8. Bond order of N_2 molecule is ……….

9. When a nuclide decays by β emission the N/P ratio is ……….

10. Example for a molecule which possesses trigonal planar structure is….

(10 × 1 = 10 Marks)

SECTION-B

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

11. Calculate normality of aqueous solution containing 10.0 g of crystalline oxalic acid ($H_2C_2O_4$) in 500ml of water.

12. What are compexometric titrations?

13. Define standard solution with example.

14. Calculate uncertainty in the velocity of an electron if the uncertainty in its potion is 200 pm (mass of electron = 9.1 x 10^{-31} kg)

    What is Born-Haber cycle?

15. What is an ionic bond, explain with an example?

16. What is meant by Hybridisation?

17. Distinguish between isotones and isobars

18. What are metalloenzymes?

19. Explain the process of Photosynthesis.

(7 × 2 = 14 Marks)

SECTION-C
Answer any *four* questions. Each question carries 5 marks.

20. Correlate N/P ratio and nuclear stability.

21. What are the postulates of VSEPR theory?

22. Define equivalent mass of an oxidising agent. Calculate the equivalent mass of $KMnO_4$ based on this concept.

23. Discuss the limitations of Bohr model, also explain uncertainty principle.

24. Discuss Ostwald's theory of acid base indicators.

25. What are redox titrations? Give an example.

$$(4 \times 5 = 20 \text{ Marks})$$

SECTION-D
Answer any *two* questions. Each question carries 10 marks.

26. a) Distinguish between the terms molarity and molality

    b) Discuss Arrhenius concept of acids and bases

    c) What mass of NaOH will be present in 500ml of its 0.5M solution?

$$(3 + 3 + 4 = 10 \text{ Marks})$$

27. a) Explain the principle of radio carbon dating?

    b) The amount of C-14 present in an old sample of wood is 1/6 th of that of a sample of new piece wood, Calculate the age of wood?

    (Half life of C-14 = 5668 years)

$$(5 + 5 = 10 \text{ Marks})$$

28. a) Explain sodium-potasium pump?

    b) Discuss functions of Haemoglobin and myoglobin?

$$(5 + 5 = 10 \text{ Marks})$$

29. a) What are quantum numbers?

    b) What are applications of lattice energy measurements?

$$(5 + 5 = 10 \text{ Marks})$$

$$(2 \times 10 = 20 \text{ Marks})$$

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