KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC
(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)
THOOTHUKUDI – 628 003

(6 Pages) **Reg. No: ……**

Question. Code No : 25E00301 **Sub Code : 24UMCH21**

UG Degree - End Semester Examinations, April 2025

Second Semester

B.Sc CHEMISTRY

Major - General Chemistry-II

(For those who joined in July 2024 onwards)

Time : 3 Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

1. Which of the following is a Bronsted-Lowry acid?

   (a) NH_3 (b) OH^-

   (c) HCl (d) Cl^-

2. Name the factor does not affect the degree of dissociation.

(a) Temperature (b) Dilution

(c) Pressure (d) Nature of solvent

3. Find out the compound contains boron and nitrogen in a six-membered ring similar to benzene.

(a) diborane (b) Borazine

(c) Boric acid (d) Borax

4. Which of the following is amphoteric in nature?

(a) NaOH (b) $Al(OH)_3$

(c) $Mg(OH)_2$ (d) $Ca(OH)_2$

5. Which of the following is a pseudohalogen?

(a) Cl_2 (b) CN_2

(c) CN^- (d) I_2

6. Find out the halogen which has the highest oxidizing power.

(a) Cl_2 (b) Br_2

(c) I_2 (d) F_2

7. Which reagent is commonly used in the hydroxylation of alkenes?

(a) $KMnO_4$ (b) HCl

(c) H_2 (d) $AlCl_3$

8. The main product of the reaction of ethene with HBr

(a) Ethane (b) Bromoethane

(c) 1-bromoethane (d) 2-bromoethane

9. Which one of the following reactions does not occur in aromatic compounds under normal conditions?

(a) Substitution (b) Addition

(c) Nitration (d) Halogenation

10. Which intermediate is formed during electrophilic aromatic substitution?

(a) Free radical (b) Carbocation (arenium ion)

(c) Carboanion (d) Carbene

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Explain the Lewis concept with examples and mention its limitations.

(OR)

(b) What is the ionic product of water? How is it affected by temperature?

12. (a) Discuss the position of hydrogen in the periodic table and its resemblance with alkali metals.

(OR)

(b) Explain the extraction of aluminium from bauxite with relevant chemical reactions.

13. (a) Compare the structure and bonding in PH_3 and NH_3.

(OR)

(b) Write the short note on Marshall's acid.

14. (a) Describe the process of cracking, isomerisation in petroproducts.

(OR)

(b) Explain the Bayer's strain theory with example and mention its limitations.

15. (a) Explain Huckel's rule of aromaticity with examples.

(OR)

(b) Discuss the synthesis and properties of naphthalene.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 500 words.

16. (a) Describe the concept of solubility product and explain its applications.

(OR)

(b) Explain the concept and types of buffer solution. Discuss the mechanism of buffer action with reference to acidic and basic buffers.

17. (a) Discuss the preparation, structure and nature of bonding in diborane.

(OR)

(b) Illustrate the anomalous behaviour of beryllium and its compounds with suitable chemical equations.

18. (a) Explain the chemistry of hydrazine and hydroxylamine.

(OR)

(b) Write a detailed note on the chemistry of halogens with reference to the oxidation states, oxidising power, electron affinity and electronegativity.

19. (a) State and explain Saytzeff's rule and Hofmann's rule in elimination.

(OR)

(b) Illustrate the Diel's-Alder reaction and free radical addition in alkadienes.

20. (a) Discuss the general mechanism of aromatic electrophilic substitution of sulphonation and Friedel Craft's alkylation.

(OR)

(b) Illustrate the structure, stability and molecule orbital picture of benzene ring.