

# **KAMARAJ COLLEGE (Autonomous)**

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI - 628 003

**( 4 Pages)**

**Reg. No:.....**

**Question. Code No : 2400033**

**Sub Code : 24UFCH11**

**UG Degree - End Semester Examinations, November 2024**

**First Semester**

**B.Sc. Chemistry**

**FC - FOUNDATION COURSE FOR CHEMISTRY**

**(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. ----- has the highest ionisation potential
  - a) lithium
  - b) boron
  - c) beryllium
  - d) neon
2. The shape of an orbital is governed by
  - a) azimuthal quantum
  - b) principal quantum

- number
- number
- c) magnetic quantum number
- d) spin quantum number
3. Which among the following is a paramagnetic molecule?
- a)  $H_2$
- b) HF
- c)  $O_2$
- d) HCl
4. -----type of hybridisation present in tetrahedral complexes.
- a) sp
- b)  $sp^2$
- c)  $sp^3$
- d)  $dsp^2$
5. The IUPAC name of the compound with the molecular formula  $CH_3CH_2COCH_3$
- a) Propanone
- b) Butanone
- c) Ethylmethylketone
- d) Methyl ethyl ketone
6.  $\pm$  Lactic acid mixture is known as
- (a) Meso mixture
- (b) Racemic mixture
- (c) Simple mixture
- (d) Complex mixture
7.  $P \propto 1/V$  at constant temperature. This is
- (a) boyle's law
- (b) Avagadro's law
- (c) Gay Lassaie's law
- (d) Charle's law
8. The forces that hold molecules together due to dipole - induced dipole forces are known as \_\_\_\_\_
- a) keesom forces
- b) Van der waals forces
- c) Debye forces
- d) Ionic forces
9. Which has the maximum wavelength?
- a) Radiofrequency region
- b) Microwave region
- c) IR region
- d) ESR region
- 10 The selection rule for vibrational spectroscopy is

a)  $\Delta J = \pm 1$

b)  $\Delta V = \pm 1$

c)  $\Delta J = 0$

d)  $\Delta V = \pm 0$

**PART B - (5X5=25 Marks)**

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

**Answer should not exceed 250 words.**

11. (a) What are quantum numbers? Explain their significances.

**(OR)**

- (b) Define ionization potential. How does it vary groups as well as periods?

12. (a) Explain: paramagnetism.

**(OR)**

- (b) Describe the postulates of VB theory.

13. (a) Carbon is unique among the elements. Justify

**(OR)**

- (b) Explain the different types of structural isomerism with suitable examples.

14. (a) State the laws of ideal gases.

**(OR)**

- (b) Discuss briefly about intermolecular forces.

15. (a) Discuss the general characteristics of wave.

**(OR)**

- (b) Explain about the quantization of energy levels given by Born Oppenheimer approximation.

**PART C - (5 × 8 = 40 Marks)**

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

**Answer should not exceed 500 words.**

16. (a) Discuss the classification of elements on the basis of their electronic configuration.

**(OR)**

(b) Discuss the shapes of atomic orbitals.

17. (a) Explain percentage ionic character of covalent bond.

**(OR)**

(b) Define hybridisation. Explain the type of hybridisation involved in SF<sub>6</sub> molecule.

18. (a) Explain the terms: (i) enantiomers (ii) meso compounds

**(OR)**

(b) (i) Give the structure of organic compounds.

(1) 1, 3 butadiene (2) 2-propanol (3) 2-(hydroxy methyl) propanol (ii) Write notes on stereoisomerism.

19. (a) Discuss the postulates of kinetic theory of gases.

**(OR)**

(b) Define surface tension. Explain the factors affecting surface tension.

20. (a) Explain absorption and emission spectra.

**(OR)**

(b) Discuss the types of spectroscopy.