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FIRST YEAR (NEP Version II)
COURSE CODE: 24CHE11101
COURSE NAME: Fundamentals of Chemistry
(Semester I)

Program: B.Sc. General
Program Specific: F.Y.B.Sc.
Course Type: MAJOR
Paper: I

Credits: 2
Time: 2 Hours
Max. Marks: 30
SET: A

1. Instructions to the candidate:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw a well labelled diagram wherever necessary.

Q1) Attempt ANY SIX of the following:

[6 x 2 = 12]

1. Define frequency. Give its SI unit.
2. Name any two spectral series observed in hydrogen atom.
3. Give the formula to calculate the energy of an electron in hydrogen atom and explain terms used in it.
4. State Pauli's Exclusion Principle and Hund's Rule of maximum multiplicity.
5. Give general electronic configuration of s block.
6. Define Ionisation energy. Name its unit.
7. What is an Ionic bond? Give an example of compound containing ionic bond.
8. Name the hybridisation observed in Methane and Acetylene molecules.

Q2) Attempt ANY THREE of the following:

[3 x 4 = 12]

- i. Calculate radius of third orbit in nm of hydrogen atom.
- ii. Write electronic configuration of Pb (Z = 82). Draw Aufbau's principle diagram.
- iii. Define Metallic character and discuss its trend across period and down the group.
- iv. What is inductive effect? Explain chloroacetic acid is stronger than acetic acid.
- v. Explain tautomerism with two examples.

Q3) Attempt ANY TWO of the following:

[2 x 3 = 06]

- a) State four postulates of Bohr's theory.
- b) Find the wavelength in Angstrom units of the spectral line associated with drop of electron from the third orbit to second orbit of hydrogen atom. [Given: Rydberg constant = $1.097 \times 10^7 \text{ m}^{-1}$]
- c) Name elements in s block and mention any two uses of s block elements.
- d) Draw the resonance structures of aniline molecule and phenoxide ion.