

Time: 2:40 Hours

SUBJECTIVE

Marks: 68

Note: Section-I is compulsory. Attempt any THREE (3) questions from Section-II.

## SECTION - I

2. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- Calculate the moles of Cl atoms in 0.822 g of  $C_2H_4Cl_2$ .
- What is the difference between gram atom and gram ion?
- No individual neon atom has a mass of 20.18 amu. Why?
- How does the respiration process involve Dalton's law of partial pressures?
- Give the quantitative definition of Charles's law.
- Where is plasma found?
- What is Moseley's law? Give its significance.
- Write down the electronic configuration of  $_{29}Cu$  and  $_{19}K$ .
- The velocities of electrons in higher orbits are less than those in lower orbits of hydrogen atom. Give the reason.
- Define standard enthalpy of combustion. Give an example.
- What is meant by state function? Give two examples.
- Define exothermic reaction. Give an example.

3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- Define water of crystallization. Give example.
- How do you justify that the boiling point of one molal urea solution is  $100.52^\circ C$  but the boiling point of two molal urea solution is less than  $101.04^\circ C$ ?
- Give two statements of Raoult's law.
- Differentiate between fast step and the rate determining step.
- What are enzymes? Give an example.
- The reaction happens due to collisions among the molecules but all the collisions are not fruitful. Justify it.
- How does a Gooch crucible increases the rate of filtration?
- Give the main characteristics of the solvent used for crystallization.
- What is ether extraction?
- Define polymorphism. Give example.
- Hydrogen bonding is present in chloroform and acetone. Justify it.
- How liquid crystals can act as temperature sensors?

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- Atomic radius decreases from left to right in a period, justify.
- Define electron affinity, give one example.
- How the criteria of electronegativity helps us to understand the nature of bond?
- What is buffer capacity?
- Value of  $pK_a$  and  $pK_b$  are related to strength of acid and bases. Justify it.
- Define solubility product with an example.
- Differentiate between electrolytic and galvanic cell.
- What is electrolysis? Give an example.
- How anodized aluminium is prepared in an electrolytic cell?

(Turn Over)