

SECTION – I

2. Write short answers to any EIGHT (8) questions :

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- (i) Why we use the term relative atomic mass?
- (ii) Many chemical reactions take place in our surroundings involve limiting reactant. Give reason.
- (iii) How can you justify with example that molecular formula = $n \times$ empirical formula
- (iv) In solvent extraction why repeated extraction using small portion of solvent is more efficient than single extraction using large volume of solvent.
- (v) How the decolorization of crude crystal can takes place?
- (vi) What is the purpose of Gooch Crucible?
- (vii) Give characteristics of plasma.
- (viii) What are the faulty points of kinetic molecular theory of gas?
- (ix) Water vapours do not behave ideally at 273 K. Give reason.
- (x) Give applications of common ion effect (any two).
- (xi) How do the buffer acts?
- (xii) Solubility of glucose in water is increased by increasing temperature. Give reason.

3. Write short answers to any EIGHT (8) questions :

16

- (i) What is polarizability? Give its relation with London dispersion forces.
- (ii) Why H_2O is liquid but NH_3 is gas at room temperature?
- (iii) Why graphite conduct electricity in one direction only not in other?
- (iv) What is habit of crystal? How it is changed?
- (v) Why positive rays are called canal rays?
- (vi) How neutrons were discovered?
- (vii) Give difference between continuous spectrum and line spectrum.
- (viii) What are slow and fast neutrons?
- (ix) What is continuous solubility curve? Which solution give this type of curve?
- (x) Why 1 molal solution of NaOH is dilute as compared to its 1 molar solution?
- (xi) What is order of reaction? Give examples.
- (xii) What do you mean by rate determining step? Give example.

4. Write short answers to any SIX (6) questions :

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- (i) Why the size of a cation is smaller as compared to its parent atom?
- (ii) What is octet rule? Give one example.

4. (iii) Define co-ordinate covalent bond, give one example.
- (iv) Dipole moment of CO_2 is zero but SO_2 is 1.61 D. Why?
- (v) Define thermochemistry.
- (vi) Define enthalpy of formation. Give example.
- (vii) Describe enthalpy of neutralization by taking example of HCl and NaOH .
- (viii) Describe Nickle Cadmium Cell.
- (ix) Define anode and cathode.

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) How can the percentage of carbon, hydrogen and oxygen in the given organic compound be estimated by combustion analysis? 4
- (b) Derive an expression to calculate the radius of revolving electron in the n th orbit of hydrogen atom. 4
6. (a) A sample of nitrogen gas is enclosed in a vessel of volume 380 cm^3 at 120°C and pressure of 101325 Nm^{-2} . This gas is transferred to a 10 dm^3 flask and cooled to 27°C . Calculate the pressure in Nm^{-2} exerted by a gas at 27°C . 1,1,1,1
- (b) Explain the structure and function of voltaic or galvanic cell. 1,3
7. (a) Explain type of hybridization in H_2O and NH_3 . 2,2
- (b) State first law of thermodynamics. Also prove that $\Delta E = q_2$. 1,3
8. (a) Write four properties of covalent solids. 1,1,1,1
- (b) The solubility of CaF_2 in water at 25°C is found to be $2.05 \times 10^{-4} \text{ mol dm}^{-3}$. What is the value of K_{sp} at this temperature? 4
9. (a) Describe a method to determine the boiling point elevation of a solution. 3,1
- (b) Define order of reaction. Describe it with three examples. 1,3

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