

SECTION – I

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

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- (i) Define relative atomic mass. Give two examples.
- (ii) Calculate the percentage of nitrogen in NH_2CONH_2 . (Atomic masses of C = 12 , N = 14 , O = 16 and H = 1)
- (iii) Define gram formula giving one example.
- (iv) Write two disadvantages of drying crystals in the folds of filter paper.
- (v) Define distribution law about solvent extraction.
- (vi) Derive Graham's law of diffusion from kinetic equation.
- (vii) Give two reasons for deviation of real gases from ideal behaviour.
- (viii) Write down two characteristics of plasma.
- (ix) Derive the SI units of van der Waal's constant 'a'.
- (x) Sea water has $5.65 \times 10^{-3} g$ of dissolved oxygen in one kg of water. Calculate the concentration of oxygen in sea water in parts per million (ppm).
- (xi) Define molal boiling point constant. Give one example.
- (xii) Define solubility curve. Name its two types.

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

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- (i) Why ice occupies 9% more volume than liquid water?
- (ii) Why evaporation causes cooling?
- (iii) Write two applications of liquid crystals.
- (iv) Why heat of sublimation of I_2 is very high than other halogens?
- (v) Write defects of Rutherford atomic model.
- (vi) State Moseley law and also give its importance.
- (vii) Why e/m value of cathode rays is equal to that of electron?
- (viii) State Hund's rule.
- (ix) How does buffer act?
- (x) Give optimum conditions to get maximum yield of NH_3 .
- (xi) Justify that radioactive decay is always a first order reaction.
- (xii) Describe auto catalysis with example.

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

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- (i) Why the radius of an atom can not be determined precisely?
- (ii) Define ionization energy. Give its trend in periods and group of periodic table.
- (iii) How electronegativity changes in a group?
- (iv) Define coordinate covalent bond. Give one example.
- (v) Explain that burning of candle is a spontaneous process. Justify.

4. (vi) Define state and state function.
(vii) Write reactions taking place at anode and cathode in silver oxide battery.
(viii) How is aluminum anodized in an electrolytic cell?
(ix) Calculate oxidation number of *Cr* in K_2CrO_4 .

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Describe combustion analysis method for the determination of percentage composition of an organic compound. 4
(b) Define ionic solids. Give their three properties. 4
6. (a) One mole of methane gas is maintained at 300 K, its volume is 250 cm^3 . Calculate the pressure exerted by the gas, when the gas is ideal. 4
(b) Write four defects of Bohr's atomic model. 4
7. (a) Draw the molecular orbital picture of O_2 molecule. 4
(b) State Hess's law of constant heat summation. Explain it giving two examples. 4
8. (a) $Ca(OH)_2$ is a sparingly soluble compound. Its solubility product is 6.5×10^{-6} . Calculate the solubility of $Ca(OH)_2$. 4
(b) How does the Arrhenius equation help us to calculate energy of activation of a reaction? 4
9. (a) Give the three statements of Raoult's law. 4
(b) Describe the electrolysis of concentrated solution of $NaNO_3$ in aqueous solution. 4

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