

SECTION – I

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

16

- (i) Define percentage yield give example.
- (ii) How many moles of CO_2 can be produced from burning one mole of octane mass of octane is 114?
- (iii) Calculate mass in grams of 2.74 mole of KMnO_4 .
- (iv) How do you differentiate between diffusion and effusion?
- (v) Gases show non ideal behaviour at low temperature and high pressure, give reason.
- (vi) What is Avogadro's law of gases? Give example.
- (vii) Write electronic configuration of Cu_{29} and K_{19}
- (viii) Why positive rays are also called as canal rays?
- (ix) Why oxygen molecule is paramagnetic in nature?
- (x) Define state function, give example.
- (xi) Justify that heat of formation of a compound is the sum of all the other enthalpies.
- (xii) What is a spontaneous process? Give two examples.

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

16

- (i) What is difference between qualitative and quantitative analysis?
- (ii) Define sublimation. Write name of two compounds which can be sublimed.
- (iii) Write two uses of chromatography.
- (iv) What are intermolecular forces of attraction? Give two examples.
- (v) Evaporation causes cooling. Give reason.
- (vi) Diamond is hard and an electrical insulator. Give reason.
- (vii) Differentiate between hydration and hydrolysis.
- (viii) The concentration in terms of molality is independent of temperature but molarity depends upon temperature. Give reason.
- (ix) Justify that the boiling point of one molal urea solution is 100.52°C but the boiling point of two molal urea solution is less than 101.04°C .
- (x) Define homogeneous catalysis. Give one example.
- (xi) Justify that the radioactive decay is always a first order reaction.
- (xii) Differentiate between rate and rate constant of a reaction.

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

12

- (i) Define bond order. Give one example.
- (ii) Differentiate between bonding molecular orbital and antibonding molecular orbital.

(Turn Over)

4. (iii) The radius of an anion is always larger than parent atom. Why?
- (iv) How does the equilibrium constant of a reaction tell us the direction of a chemical reaction?
- (v) How can NaCl be purified by common ion effect?
- (vi) What are pK_a and pK_b ? How do they show the acidic and basic strength?
- (vii) What is the function of salt bridge in galvanic cell?
- (viii) What is anodized aluminium?
- (ix) Calculate the oxidation state of Mn in $KMnO_4$ and K_2MnO_4

SECTION – II

Note : Attempt any THREE questions.

5. (a) Define the following terms with examples :
 (i) Relative atomic mass (ii) Molecular ion (iii) Isotope (iv) Molar volume. 1,1,1,1
 (b) 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 the gas at 27°C . 4
6. (a) Describe four properties of the crystalline solids. 4
 (b) What is bomb calorimeter and describe it with the help of diagram? 4
7. (a) Derive the equation to calculate radius of electron in n th orbit hydrogen atom by using Bohr's model. 4
 (b) The solubility of PbF_2 at 25°C is 0.64 g dm^{-3} . Calculate K_{sp} of PbF_2 . 4
 At. Mass of Pb = 207
 At. Mass of F = 19
8. (a) Define atomic orbital hybridization. How can we describe the geometry of NH_3 on its basis? 4
 (b) What is lead accumulator battery? Discuss its discharging process. 4
9. (a) Discuss Raoult's law when one component is volatile other is non-volatile. 4
 (b) Describe half life method and method of large excess for finding the order of reaction. 2,2

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