



**PARISHRAM PUBLICATIONS
PUNE**

NAME of Student : _____

Subject : CHEMISTRY

Class : XI

Max. Marks :- 80

Topic : Some Basic Concepts of Chemistry (STOICHIOMETRY)

Have patience all things are difficult before they become easy.

Instructions :

- (i) For each question in Section I, you will be awarded 3 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (– 1) mark will be awarded.
- (ii) For each question in Section II, you will be awarded 3 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (– 1) mark will be awarded.
- (iii) For each question in Section III, you will be awarded 3 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (– 1) mark will be awarded.
- (iv) For each question in Section IV, you will be awarded 2 marks for each row in which you have darkened the bubble(s) corresponding to the correct answer. Thus, each question in this section carries a maximum of 8 marks. There is no negative marking for incorrect answer(s) for this section.
- (v) For each question in Section V, you will be awarded 3 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (–1) mark will be awarded.
- (vi) For each question in Section VI, you will be awarded 3 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (– 1) mark will be awarded.

SECTION - I

This section contains 8 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

- Q.1** CH_3COOH dimerise in benzene according to reaction : $2\text{CH}_3\text{COOH} \rightarrow (\text{CH}_3\text{COOH})_2$
If 60% mole of CH_3COOH goes in dimer formation and remaining is in monomer form then what is average molecular mass of CH_3COOH .
(A) 90 (B) 60 (C) 85.71 (D) 96
- Q.2** $\text{KO}_2 + \text{H}_2\text{O} \rightarrow \text{KOH} + \text{H}_2\text{O}_2 + \text{O}_2$.
14.2gm. KO_2 when treated with excess H_2O , it gives only 1.7gm H_2O_2 . So % yield of H_2O_2 should be –
(A) 20% (B) 30% (C) 40% (D) 50%
- Q.3** A chemist decided to determine the Empirical formula of an unknown compound. He collects following information :
(i) Compound contains 2 : 1 ratio of H and O atoms (number of atoms)
(ii) Compound has 40% C by mass
(iii) Compound contains C, H and O only
What is the empirical formula of the compound –
(A) CH_3O (B) CH_2O (C) $\text{C}_2\text{H}_2\text{O}$ (D) CH_3O_2
- Q.4** In the reaction, $2\text{Al}(\text{s}) + 6\text{HCl}(\text{aq}) \rightarrow 2\text{Al}^{3+}(\text{aq}) + 6\text{Cl}^{-}(\text{aq}) + 3\text{H}_2(\text{g})$
(1) 6L $\text{HCl}(\text{aq})$ is consumed for every 3 L $\text{H}_2(\text{g})$ produced
(2) 33.6L $\text{H}_2(\text{g})$ is produced regardless of temperature and pressure for every mole Al that reacts.
(3) 33.6 L $\text{H}_2(\text{g})$ at STP is produced for every 27 gm Al that reacts.
(4) 11.2 L $\text{H}_2(\text{g})$ at STP is produced for every $\text{HCl}(\text{aq})$ consumed.
Choose the correct options –
(A) 1, 2 (B) 2, 3 (C) 3, 4 (D) 1, 2, 3, 4

- Q.5** Which of the following molarity values of ions in an aqueous solution of 5.85% w/v NaCl, 5.55% w/v CaCl₂ and 6% w/v NaOH are correct.
 (1) [Cl⁻] = 2M (2) [Na⁺] = 1M (3) [Ca²⁺] = 0.5M (4) [OH⁻] = 1.5M
 Choose the correct options –
 (A) 1, 2 (B) 2, 3 (C) 3, 4 (D) 1, 3, 4
- Q.6** 0.250 g of an element M reacts with excess of fluorine to produce 0.547 g of the hexafluoride MF₆. What is the element ? (At. wt.s of F = 19, Cr = 52, Mo = 96, S = 32, Te = 127.6)
 (A) Cr (B) Mo (C) S (D) Te
- Q.7** Calculate the mass of oxygen required to burn 14g C₂H₄ completely-
 (A) 48gm. (B) 54 gm (C) 36 gm (D) 78 gm.
- Q.8** Calculate the volume of H₂ at STP that will be displaced by 1 gram of Zn when it is completely dissolved in dilute sulphuric acid.
 (A) 0.1425 dm³ (B) 2.3425 dm³ (C) 0.3425 dm³ (D) 1.3425 dm³

SECTION - II

This section contains 3 multiple choice questions . Each question has 4 choices (A), (B), (C) and (D), out of which one or more answers are correct.

- Q.9** Ammonia (NH₃) gas combines with oxygen gas over Pt catalyst to produce Nitric oxide (NO) and water. If 13.6g of NH₃ gas is taken initially then –
 (A) Volume of oxygen gas required at NTP is 22.4 litre
 (B) Volume of H₂O (ℓ) produced at 4°C (assuming density of water as 1000 Kg/m³) is 21.6ml.
 (C) Total mass of products obtained is 45.6g
 (D) Number of moles of NO produced is 0.8
- Q.10** You are given 5m (molal) aqueous solution of H₂SO₄ of density 1.49 gm/ml, then –
 (A) molarity (M) of the solution = 5M (B) mole fraction of solute = 0.083
 (C) % by weight of H₂SO₄ = 40% (D) concentration of H⁺ ion = 10M
- Q.11** A sample of H₂O₂ solution labelled as 28 volume has density of 26.5 g/L. Mark the correct option(s) representing concentration of same solution in other units –
 (A) M_{H₂O₂} = 2.5 (B) % $\frac{w}{v}$ = 17
 (C) Mole fraction of H₂O₂ = 0.2 (D) M_{H₂O₂} = 13.88

SECTION - III

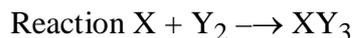
This section contains paragraph. Based upon each paragraph, 3 multiple choice questions have to be answered. Each question has 4 choices (A), (B), (C) and (D), out of which only one is correct.

Passage for Q.12-Q.14

We know that balancing of a chemical equation is entirely based on law of conservation of mass. However the concept of Principle of Atom Conservation (POAC) can also be related to law of conservation of mass in a chemical reaction. So, POAC can also act as a technique for balancing a chemical equation.

- Q.12** Which of the following relation is correct regarding the numerical coefficients p, q, r in the balanced chemical equation : pA + qB₂ → rA₂B₆
 (A) 2p = r (B) q = 1.25p (C) r = 2q (D) q = 0.8p
- Q.13** If the weight ratio of C and O₂ present is 1 : 2 and both of reactants completely consume and form CO and CO₂. What would be the mole ratio of CO and CO₂ in mixture.
 (A) 11 : 7 (B) 2 : 1 (C) 1 : 1 (D) 1 : 2

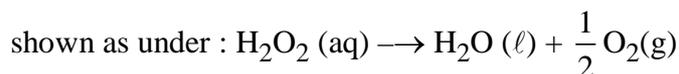
Q.14 If the atomic masses of X and Y are 10 and 30 respectively, then the mass of XY_3 formed when 120g of Y_2 reacts completely with X is :



- (A) 133.3g (B) 200g (C) 266.6g (D) 400g

Passage (Q.15-Q.17)

The strength of H_2O_2 is expressed in several ways like molarity, normality, % (w/V),, volume strength, etc. The strength of “10V” means 1 volume of H_2O_2 on decomposition gives 10 volumes of oxygen at STP or 1 litre of H_2O_2 gives 10 litre of O_2 at STP. The decomposition of H_2O_2 is shown as under :



H_2O_2 can acts a oxidising as well as reducing agent, as oxidizing agent H_2O_2 converted into H_2O and as reducing agent H_2O_2 converted into O_2 both cases it's n-factor is 2.

\therefore Normality of H_2O_2 solution = $2 \times$ Molarity of H_2O_2 solution

Q.15 What is the molarity of “11.2V” of H_2O_2 ?

- (A) 1M (B) 2M (C) 5.6M (D) 11.2M

Q.16 What is the percentage strength (% w/V) of 11.2V H_2O_2 ?

- (A) 1.7 (B) 3.4 (C) 34 (D) None of these

Q.17 20mL of H_2O_2 solution is reacted with 80mL of 0.05 M $KMnO_4$ in acidic medium then what is the volume strength of H_2O_2 ?

- (A) 2.8 (B) 5.6 (C) 11.2 (D) None of these

SECTION - IV

This section contains match the column question . Four statements (A, B, C and D) are given in column I and four/five statements (p, q, r, s and t) in Column II. Any given statement in column I can have correct matching with one or more statement(s) given in column II.

Q.18 Match the column –

Column I

- (A) 4.1g H_2SO_3
(B) 4.9g H_3PO_4
(C) 4.5g oxalic acid ($H_2C_2O_4$)
(D) 5.3g Na_2CO_3

Column II

- (p) 200ml of 0.5 base is used for complete neutralization
(q) 200 milli moles of oxygen atoms
(r) Central atom has its highest oxidation number
(s) May react with an oxidising agent
(t) 100 milli moles of hydrogen atoms

SECTION - V

This section contains 5 questions. The answer to each of the questions is a single digit integer, ranging from 0 to 9.

Q.19 In the following reaction, ratio of x and y is $xHI + yHNO_3 \longrightarrow NO + I_2 + H_2O$.

Q.20 Calculate the n-factor of Cu_2S in $Cu_2S \longrightarrow Cu^{2+} + SO_2$.

Q.21 A solution is prepared by mixing of 10 ml ethanol with 190 ml of water. What is volume percentage of ethanol.

Q.22 12.6 gm oxalic acid present in 550 gm of the solution. Density of the solution is 1.10 gm/ml. If the normality is x then find the value of 10x.

Q.23 Find the oxidation number of S in HSO_3^- ion.

SECTION - VI

This section contains 2 questions. Each questions contain STATEMENT-1 (Assertion) and STATEMENT-2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

- (A) Statement- 1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement -1
(B) Statement -1 is True, Statement -2 is True ; Statement-2 is NOT a correct explanation for Statement - 1
(C) Statement - 1 is True, Statement- 2 is False
(D) Statement -1 is False, Statement -2 is True

Q.24 Statement 1 : As mole is the basic chemical unit, the concentration of the dissolved solute is usually specified in terms of number of moles of solute.

Statement 2 : The total number of molecules of reactants involved in a balanced chemical equation is known as molecularity of the reaction.

Q.25 Statement 1 : Equivalent weight of Cu in CuO is 31.8 and in Cu₂O is 63.6.

Statement 2 : Equivalent weight of an element = $\frac{\text{Atomic weight of the element}}{\text{Valency of the element}}$.