CHEMISTRY

BOOKS - NARENDRA AWASTHI

STOICHIOMETRY

Exercise

1. Calculate number of neutrons present in 12×10^{25} atoms of oxygen $\left(8O^{17}\right)$: (Given : $N_A = 6 \times 10^{23}$)

▶ Watch Video Solution

2. If mass of one atom is $3.32 \times 10^{-23} g$, then calculate number of nucleons (neutrons and protons) present in 2 atoms of the element:

▶ Watch Video Solution

3. Calculate number of electron present in 9.5 g of PO_4^{3-} :

4. What is the number of moles of O-atoms in 126 amu of HNO_3 ?

5. What is the charge of 96 amu of s^{2-} ?

6. A sample of sodium has a mass of $46g$. What is the mass of the same number of calcium atoms as sodium atoms present in given sample ?

7. The total number of neutrons present in $54mLH_2O(l)$ are :

8. Total number of electrons present in $48gmG^{2+}$ are :

9. Cisplation , an anticancer drug , has the molecular formula $Pt(NH_3)_2Cl_2$. What is the mass (in gram) of one molecule ? (Atomic masses $: Pt = 195, H = 1.0, N = 14, Cl = 35.5$)

10. Aspirin has the formula $C_9H_8O_4$. How many atoms of oxygen are the there in a table weight 360 mg ?

11. 20 g of ideal gas contans only atoms of S and O occupies 5.6 L at 1 atm ans 273 K . What is the molecular mass of gas ?

12. A sample of ammonium phosphate, $(NH_4)_3PO_4,$ contains 6 moles of hydrogen atoms. The number of moles of oxygen atoms in the sample is :

13. Total number of moles of oxygen atoms in 3 litre $O_3(g)$ at $27°C$ and 8.21 atm are :

14. 3.011×10^{22} atoms of an element weighs $1.15gm.$ The atomic mass of the element is :

15. One atom of an element x weighs $6.643 \times 10^{-23}g$. Number of moles of atoms in its $20kg$ is :

A. 4

B. 40

C. 100

D. 500

Answer: D

16. Mass of one atom of the element A is $3.9854 \times 10^{-23}g$. How many atoms are contained in 1g of the element A ?

17. Which of the following contains the largest mass of hydrogen atoms ?

A) 5 mole C2H2O4 B) 1.1 Mole C3H8O3 C) 1.5 Mole C6H8O6 D) 4 Mole C2H4O2

18. Which has minnimum number of oxygen atom ?

A. 10mL H2O(l) [density of water =1 gmL-1

B. 0.1 mol V2O5

C. 12 g O3

D. 12.044 * 10^23 Molecules of CO2

19. Rearrange the following (I to IV) in the order of increasing masses : A) 0.5 Mole of O3 B) 0.5g of oxygen C) 3.011 * 10^23 Molecules of O2 D) 5.6 Litres of CO2 at STP

▶ Watch Video Solution

20. If the volume of a drop of water is $0.0018 mL$ then the number of water molecules present in a drop of water at room temperature is :

▶ Watch Video Solution

21. Common salt obtained from sea-water contains $8.775 \% \, NaCl$ by mass. The number of formula units of $NaCl$ present in $25g$ of this salt is :

▶ Watch Video Solution

22. The number of hydrogen atoms present in $25.6g$ of sucrose $(C_{12}H_{22}O_{11})$ which has a molar mass of $342.3g$ is :

> ▶ **Watch Video Solution**

23. Caffiene has a molecular mass of 194. If it contains 28.9% by mass of nitrogen, number of atoms of nitrogen in one molecule of caffeine is :

> ▶ **Watch Video Solution**

24. The density of water is 1g/mL. Water is the volume occupied by 1 molecule of water ?

> ▶ **Watch Video Solution**

25. A $25.0mm \times 40.0mm$ piece of gold foil is $0.25mm$ thick. The density of gold is $19.32\dfrac{g}{c}m^3$. How many gold atoms are in the sheet ? (Atomic

weight : $Au = 197.0$)

26. If average molecular mass of air is 29, then assuming N_2 and O_2 gases

are there, which option are correct regarding composition of are?

(i)

75 % by mass ofN_2 (ii) 75 % by moles N_2 (

A. only i) is correct

B. only ii) is correct

C. both ii) and iii) are correct

D. both i) and ii) are correct

27. Density of dry air containing ony N_2 and O_2 is $1.15\dfrac{g}{L}$ at $740mm$ of Hg and $300K$. What is % composition of N_2 by mass in the air ?

28. A gaseous mixture of H_2 and CO_2 gases contains 66 mass % of CO_2. The vapour density of the mixture is :

29. The vapour density of a maxture containing NO_2 and N_2O_4 is 27.6. The mole fraction of N_2O_4 in the mixture is :

30. Average atomic mass of magnesium is 24.31amu. This magnesium is composed of 79 mole % of $24mg$ and remaining 21 mole % of

$25mg$ and $25mg$. Calculate mole % of $26mg$.

31. Indium (atomic mass $= 114.82$) has two naturally occurring isotopes, the predominant one from has isotopic mass 114.9041 and abundance of 95.72%. What is the mass for the other isotope ?

32. Calculate density of a gaseous mixture which consist of 3.01×10^{24} molecules of N_2 and $32g$ of O_2 gas at 3 atm pressure and $860K$ temperature (Given : $R = \dfrac{1}{2}$ atm $\dfrac{L}{m} o \leq . K$)

33. A mixture of O_2 and gas "Y" (mol. Mass 80) in the moe ratio a: b has a mean molecular mass 40. What would be mean molecular mass , if the

gases are mixed in the ratio b: a under identical conditions? (Assume that gases are non- reacting):

34. If water sample are taken from sea, rivers or lake, they will be found to contain hydrogen and oxygen in the approximate ratio of $1:8$. This indicates the law of :

35. Hydrogen and oxygen combine to from H_2O_2 and H_2O containing 5.93% and 11.2% hydrogen respectively . The data illustrates :

36. A sample of calcuium carbonate $(CaCO_3)$ has the following percentage composition: $Ca = 40\%$, $C = 12\%$, $O = 48\%$ If the law

of constant proportions is true. Then the weight of calcium in $4g$ of a sample of calcium carbonate obtained from another source will be

▶ Watch Video Solution

37. All the substance listed below are fertilizers that contribute nitrogen to the soil. Which of these is the richest source of nitrogen on a mass percentage basis ? a) Urea b) Ammonia

▶ Watch Video Solution

38. One mole of element X has 0.444 times the mass of one mole of element Y. One atom of element X has 2.96 times the mass of one atom of 12_C. What is the atomic mass of y ?`

▶ Watch Video Solution

39. A given sample of pure compound contains $9.81g$ of Zn, 1.8×10^{23} atoms of chromium, and 0.60 mol of oxygen atoms. What is the simplest formula?
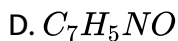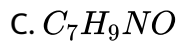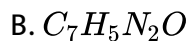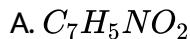
▶ Watch Video Solution

40. The formula of an acid is HXO_2. The mass of 0.0242 moles of the acid is $1.657g$. What is the atomic mass of X ?

▶ Watch Video Solution

41. What is the emprical formula of vanadium oxide , if $2.74g$ of the metal oxide contains $1.53g$ of metal ?

▶ Watch Video Solution

42. Determine the empirical fromula of kelvar, used in making bullet proof vests, is $70.6\,\%\;C$, $4.2\,\%\;H$, $11.8\,\%\;N$ and $13.4\,\%\;O$:

A. $C_7H_5NO_2$

B. $C_7H_5N_2O$

C. C_7H_9NO

D. C_7H_5NO

▶ **Watch Video Solution**

---

43. The hydrate salt $Na_2CO_3 \cdot xH_2O$ undergoes $63\,\%$ loss in mass on heating and becomes anhydrous. The value of x is :

▶ **Watch Video Solution**

44. A 6.85g sample of the hydrated $Sr(OH)_2 \cdot xH_2O$ is dried in an oven to given 3.13g of anhydrous $sr(OH)_2$. What is the value of x? (Atomic masses : $Sr = 87.60. O = 16.0, H = 1.0$)

▶ Watch Video Solution

45. What percentage of oxygen is present in the compound $CaCO_3 \cdot 3Ca_3(PO_4)_2$?

▶ Watch Video Solution

46. Deildrin, an insecticide, contains C, H, Cl and O. Combustion of $29.72mg$ of dieldrin gave $41.21mgCO_2$ and $5.63mg$ of H_2O . In a separate analysis $25.31mg$ of dieldein was converted into $57.13mg$ Ag Cl. What is the empirical formula of diedrin ?

▶ Watch Video Solution

47. A gaseous compound is composed of 85.7% by mass carbon and 14.3% by mass hydrogen. Its density is 2.28 g/litre at $300K$ and 1.0 atm pressure. Determine the molecular formula of the compound.

**48.** Complete combustion of $0.858g$ of compound X given $2.64g$ of CO_2 and 1.26 gof H_(2)O. The lowest molecular mass X can have:

49. The sulphate of a metal M contains 9.87% of M, This sulphate is isomorphous with $ZnSO_4.7H_2O$. The atomic weight of M is

50. In an organic compound of molar mass $108 gmmol^{-1} C, H$ and N atoms are presents in $9:1:3.5$ by mass. Molecular formula can be

A. $C_6H_8N_2$

B. $C_7H_{10}N$

C. $C_5H_6N_3$

D. $C_4H_{18}N_3$
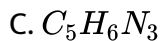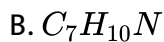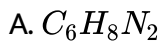
▶ Watch Video Solution

51. On analysis, a certain compound was found to contain 254g of iodine (at.mass 127) and 80g oxygen (at.mass 16). What is the formula of the compound ?

▶ Watch Video Solution

52. An element A is teravalent and another element B is divalent. The formula of the compound formed from these elements will be :

▶ Watch Video Solution

53. A compound used in making nylon, contains 43.8% oxygen. There are four oxygen atoms per molecule. What is the molecular mass of compound ?

A. 36

B. 116

C. 292

D. 146

▶ Watch Video Solution

54. Suppose two elements X and Y combine to form two compound XY_2 and X_2Y_3 weigh $85g$. The atomic masses of X and Y are respectively :

▶ Watch Video Solution

55. $44g$ of a sample on complete combustion given $88gCO_2$ and $36g$ of H_2O. The molecular formula of the compound may be :

> ▶ **Watch Video Solution**

56. 40 miligram diatomic volatile substance (X_2) is converted to vapour that displaced $4.92mL$ of air at 1atm and 300k. Atomic mass of element X is nearly :

> ▶ **Watch Video Solution**

57. Two elements $X($ atomic weight $= 75)$ and $Y($ atomic weight $= 16)$ combine to give a compound having 75.8% X.` The formula of the compound is

> ▶ **Watch Video Solution**

58. A sample of phosphorus that weighs $12.4g$ exerts a pressure 8 atm in a 0.821 litre closed vesel at $527°C$. The molecular formula of the phosphorus vapour is :

59. Manganese forms non-stoichiometric oxides having the gereral formula formula MnO_x. The value of x for the compound that analyzed 64% by mass mn :

60. 1.44 gram if titanium (Ti) reacted with excess of O_2 and produce x gram of non $-$ stoichiometric compound $Ti_{1.44}O$. The value of x is :

61. How many moles of iron can be made from Fe2O3 by the use of 16mol of CO in the following reaction: Fe2O3 + 3CO to form 2Fe + 3CO2

▶ Watch Video Solution

62. A solution is prepared by dissolving 18.25g of NaOH in distilled water to give 200ml of solution. calculate the molarity of solution.

▶ Watch Video Solution

63. $2.0g$ of a sample contains mixture of SiO_2 and Fe_2O_3. On very strong heating, it leaves a residue weighing $1.96g$. The reaction responsible for loss of mass is given below. $Fe_2O_3(s) \rightarrow Fe_3o_4(s) + O_2(s)$, (unbalance equation) what is the percentage by mass of SiO_2 in original sample ?
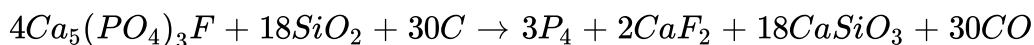
▶ Watch Video Solution

64. What volume of air at 1 atm and $273K$ containing 21% of oxygen by volume is required to completely burn sulphur (S_8) present in $200g$ of sample , which contains 20% inert material which does not burn. Sulphur burns according to the reaction $\frac{1}{8}S_8(s) + O_2(g) \rightarrow SO_2(g)$

> ▶ Watch Video Solution

65. For the reaction, $2Fe(NO_3) + 3Na_2CO \rightarrow Fe_2(CO_3)_3 + 6NaNO_3$ initially 2.5 mole of $Fe(NO_3)_3$ and 3.6 mole of Na_2CO_3 are taken. If 6.3 mole of $NaNO_3$ is obtained then $\%$ yield of given reaction is :

> ▶ Watch Video Solution

66. How many of P_4 can be produced by reaction of 0.10 moles $Ca_5(PO_4)_3F, 0.36$ moles SiO_2 and 0.90 moles C according to the following reaction ?

$4Ca_5(PO_4)_3F + 18SiO_2 + 30C \rightarrow 3P_4 + 2CaF_2 + 18CaSiO_3 + 30CO$

> ▶ Watch Video Solution

67. Calculate the mass of 2.6 gram atoms of sulphur.

68. Calculate the weight of iron which will be converted into its oxide (Fe_3O_4) by the action of 14.4g of steam on it.

69. What mass of calcium oxide will be obtained by heating 3 mol of $CaCO_3$?

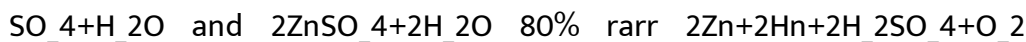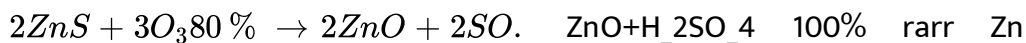**70.** How many moles of nitrogen are needed to produce 8.2moles of ammonia by reaction with hydrogen?

71. 9 moles of "D" and 14 moles of E are allowed to react in a closed vessel according to given reactions. Calculate number of moles of B formed in the end of reaction, if 4 moles of G are present in reaction vessel. (percentage yield of reaction is mentioned in the reaction) Step -1 $3D + 4E 80\% \rightarrow 5C + A$ Step-2 $3C + 5G 50\% \rightarrow 6B + F$

72. The chief ore of Zn is the sulphide ZnS. The ore is concentrated by froth floatation process and then heated in air to convert ZnS to ZnO. $2ZnS + 3O_3 80\% \rightarrow 2ZnO + 2SO$. ZnO+H_2SO_4 100% rarr Zn SO_4+H_2O and 2ZnSO_4+2H_2O 80% rarr 2Zn+2Hn+2H_2SO_4+O_2 . $The vmber of mo \leq sof$ZnS$ required f$ or $\prod uc \in g 2 mo \leq sof$Zn` will be :

73. Silver oxide (Ag_2O) decomposes at temperature $300°C$ yielding matellic silver and oxygen gas. A $1.60g$ sample of impure silver oxide yields $0.104g$ of oxygen gas. What is the per cent by mass of the silver oxide in the sample ?

> ▶ **Watch Video Solution**

74. Comprehension # 5

$342g$ of 20% by mass of $Ba(OH)_2$ solution $(sp.\ gr.0.57)$ is reacted with $1200mL$ of $2MHNO_3$ according to given balanced reaction :

$$Ba(OH)_2 + 2HNO_3 \rightarrow Ba(NO_3)_2 + 2H_2O$$
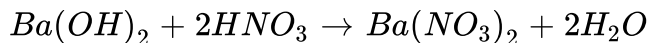
Find the molarity of the ion in resulting solution by which nature of the above solution is identified, is

> ▶ **Watch Video Solution**

75. $100mL$ of H_2SO_4 solution having molarity $1M$ and density $1.5g/mL$ is mixed with $400mL$ of water. Calculate final molarity of H_2SO_4 solution,

if final density is $1.25 g/mL$?

76. What volume of HCI solution of density $1.2\frac{g}{c}m^3$ and containing 36.5% by mass HCI, must be allowed to react wtih zinc (Zn) in order to liberate $4.0g$ of hydrogen ?

77. An ideal gaseou smixture of enthance (C_2H_6) and enthene (C_2H_4) occupies 28 litre at 1 atm and 273 K. The mixture reacts completely with 128 g O_2 to produce CO_2 and H_2O . Mole fraction at C_2H_6 in the misture is ,

78. The density of apure substance 'A' whose atoms are in cubic close pack arragement is $1g/cc$. If the all the tetrahedral voids are occupied by 'B' atom , What is the density of resulting solid in g/cc.["Atomic mass" = $(A) = 30g/mol$ and atomic mass $(B) = 50g/mol$]

▶ Watch Video Solution

79. The density of a 56.0% by mass aqueous solution of 1-propanol $(CH_3CH_2CH_2OH)$ is $0.8975\frac{g}{c}m^3$. What is the mole fraction of the 1-propanol ?

▶ Watch Video Solution

80. What is the molartiy of SO_4^{2-} ion in aqueous solution that contain 34.2 ppm of $AI_2(SO_4)_3$? (Assume complete dissociation and density of solution $1\frac{g}{m}L$)

A. $3x10^{-4}$

B. 2×10^{-4}

C. 10^{-4}

D. None

▶ Watch Video Solution

81. An aqueous solution of ethanol has density 1.025 g/mL and it is 2 M. What is the molality of this solution ?

▶ Watch Video Solution

82. 0.2 mole of HCl and 0.2 mole of barium chloride were dissolved in water to produce a $500 mL$ solution. The molarity of the $Cl -$ ions is :

▶ Watch Video Solution

83. Calculate the mass of anhyrous HCI in $10mL$ of concentrated HCI (density $= 1.2\dfrac{g}{m}L$) solution having 37% HCI by mass is :

▶ Watch Video Solution

84. Calculate the molality of 1L solution of 80% $H_2SO_4\left(\dfrac{w}{V}\right)$ given that the density of the solution is $1.80gmL^{-1}$.

▶ Watch Video Solution

85. Fluoxymesterone, $C_{10}H_{29}FO_3$, is an anabolic steroid. A 500 mL solution is prepared by dissolving $10.0mg$ of the steoid in water. $10.0mL$ portion of this solution is diluted to a final volume of $1.00L$. what is the resulting molarity ?

▶ Watch Video Solution

86. The $25mL$ of a 0.15M solution of lead nitrate, $Pb(NO_3)_2$ reacts with all of the aluminium sulphate, $Al_2(SO\_4)\_3, present \in 20$ mL $of a solution. W$ $\hat{i}s the molar concentration of the$ Al_2(SO_4)_3 +

3Pb(NO_3)_2(aq)+Al_2(SO_4)_3(aq)rarr3PbSO_4(s)+2Al(NO_3)_3(aq)`

> ▶ Watch Video Solution

87. Concentrated HNO_3 is 63% HNO_3 by mass and has a density of $1.4g/mL$. How many millilitres of this solution are required to prepare $250mL$ of a $1.20MHNO_3$ solution ?

> ▶ Watch Video Solution

88. $50mL$ of 20.8% (w/V) $BaCI_2$ (aq) and $100mL$ of 9.8% mL(w/V) H_2SO_4(aq) solutions are mixed. Molarity of Cl^- ion in the resulting solution is : (At mass of $Ba = 137$)

> ▶ Watch Video Solution

89. $100mL$ of 10% $NaOH\left(\dfrac{w}{V}\right)$ is added to $100mL$ of 10% $HCl\left(\dfrac{w}{V}\right)$. The nature of resultant solution is :

▶ Watch Video Solution

90. How many millilitres of $0.1M H_2SO_4$ must be added to $50mL$ of $0.1M NaOH$ to give a solution that has a concentration of $0.05M$ in H_2SO_4 ?

▶ Watch Video Solution

91. $1M HCl$ and $2M HCl$ are mixed in volume ratio 4:1. What is the final molarity of HCl solution?

▶ Watch Video Solution

92. Three solutions X,Y,Z of HCl are mixed to produce 100mL of 0.1M solution . The molarities of X,Y and Z are 0.7M, 0.12M and 0.15M respectively. What respective volumes of X,Y and Z should be mixed?

▶ Watch Video Solution

93. The impure 6g of NaCl is dissolved in water and then treated with excess of silver nitrate solution. The mass of p[recipitate of silver chloride is found to be 14g. The % purity of NaCl solution would be:

▶ Watch Video Solution

94. Decreasing order (first having highest and then other following it) of mass of pure NaOH in each of the aqueous solution

(P) 50 gm of $40\,\%$ (w/w) NaOH

(Q) 50 gm of $50\,\%$ (w/V) NaOH $[d_{soln.} = 1.2gm/ml]$

(R) 50 gm of 20 M NaOH $[d_{soln.} = 1gm/ml]$

▶ Watch Video Solution

95. $0.607g$ of silver salt of tribasic organic acid was quantitatively reduced to $0.37g$ of pure Ag. What is the mol. Wt. of the acid ?

96. An impure sample of sodium oxalate $(Na_2C_2O_4)$ weighing $0.20g$ is dissolved in aqueous solution of H_2SO_4 and solution is titrated at 70 C requiring $45mL$ of $0.02MKMnO_4$ solution. The end point is overrun, and back titration in carried out with $10mL$ of $0.1M$ oxalic acid solution. Find the % purity of $Na_2C_2O_4$ in sample :

97. $20mL$ of a mixture of CO and H_2 were mixed excess of O_2 and exploded & cooled. There was a volume contraction of 18mL. All volume measurements corresponds to room temperature $(27°C)$ and one

atmospheric pressure. Determine the volume ratio $(V_1 : V_2 \text{ of } Co$ anf H_2 in the original mixture .

> ▶ Watch Video Solution

98. In the reaction $2Al(s) + 6HCl(aq) \rightarrow 2AlCl3 + 3H_2$ Find the mass of AlCl3 formed with 103g of HCl react with Al?

> ▶ Watch Video Solution

99. Oxidation state(s) of chlorine in $CaOCl_2$ (bleaching powder)

> ▶ Watch Video Solution

100. The oxidation number of sulphur in S_8, S_2F_2, H_2S and H_2SO_4 respectively are :

> ▶ Watch Video Solution

101. In the chemical reaction,

$$K_2Cr_2O_7 + xH_2SO_4 + ySO_2 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + zH_2O,$$ the
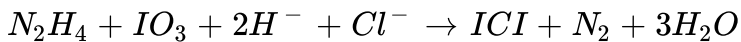
value of x, y and z respectively are :

102. Balance the followings equations and choose the quantity which is the sum of the coeffficients of reactants and products :

$$\ldots . CS_2 + \ldots . Cl_2 \rightarrow \ldots Cl_4 \ldots . S_2Cl_2$$

103. Balance the followings equations and choose the quantity which is the sum of the coefficients of reactants and products :

$$\ldots . PtCI_4 + \ldots . XeF_2 gives PtF_6 + \ldots CIF + \ldots . Xe$$

104. Hydrazinc reacts with KIO_3 in pressence of HCl as

$$N_2H_4 + IO_3 + 2H^- + Cl^- \rightarrow ICI + N_2 + 3H_2O$$

The equivalent masses of N_2H_4 and KIO_3 respectively are:

105. H_2O_2 is used as bleaching reagent because on dissociation it gives oxygen

$$\left(H_2O_2 \rightarrow H_2O + \frac{1}{2}O_2 \right)$$

"Chachi420" used H_2O_2 solution to bleach her hair and she required $2.24LO_2$ gas at 1atm and 273K. She has a H_2O_2 solution labelled '5.6V' then what volume of such solution must she required to bleach her hair?

106. A sample of 1.0g of solid $Fe_2O_3 of 80\%$ purity is dissolved in a moderately concentrated HCl solution which is reduced by zinc dust. The

resulting solution required 16.7mL of a 0.1M solution of the oxidant. Calculate the number of electrons taken up by the oxidant.

107. Stannous sulphate $(SnSO_4)$ and potassium permanganate are used as oxidising agents in acidic medium for oxidation of ferrrous ammnium sulphate to ferric sulphate. The ration of number of moles of stannous sulphate required per mole of ferrous ammonium sulphate to the number of moles of $KMnO_4$ required per mole of ferrous ammonium sulphate, is:

108. In a iodomeric estimation, the following reactions occur

$$2Cu^{2+} + 4i^- \rightarrow Cu_2I_2 + I_2, I_2 + 2Na_2S_2O_3 \rightarrow 2NaI + Na_2S_4O_6$$
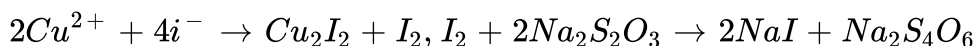
0.12 mole of $CuSO_4$ was adde to excess of KI solution and the liberated iodine required 120mL of hypo. The molarity of hypo soulution was:

109. 32g of a sample of $FeSO_4.7H_2O$ were dissolved in dilute sulphuric aid and water and its volue was made up to 1litre. 25mL of this solution required 20mL of $0.02MKMnO_4$ solution for complete oxidation. Calculate the mass% of $FeSO_4.7H_2O$ in the sample.

110. Calculate the molality of a solution containing 20.7g potassium carbonate dissolved in 500ml of solution (assume of density of solution = 1g/ml)

111. Calculate the normality of solution containing 31.5g of hydrated oxalic acid C2H2O4. 2H2O in 1250 ml of solution?

112. A solution is prepared by dissolving 2g of substance A in 18g of water. calculate the mass percentage of solute?

▶ Watch Video Solution

113. Calculate the number of millilitre of $NH_3(aq)$ solution $\left(d = 0.986\frac{g}{m}L\right)$ contain 2.5 % by mass NH_3, which will be required to precipitate iron as $Fe(OH)_3$ in a 0.8g sample that contains 50 % Fe_2O_3.

▶ Watch Video Solution

114. In the preparation of iron from haematite (Fe_2O_3) by the reduction with carbon $Fe_2O_3 + C \rightarrow Fe + CO_2$ how much 80 % pure iron may be produced from $120kg$ of 90 % pure Fe_2O_3 ?

▶ Watch Video Solution

115. A mineral consists of an equimolar mixture of the carbonates of two bivalent metals. One metal is present to the extent of 12.5% by mass $2.8g$ of the mineral on heating lost $1.32g$ of CO_2. What is the % by mass of the other metal ?

▶ Watch Video Solution

116. How many molecules and atoms of sulphur are present in 0.1 mole of S8 molecule?

▶ Watch Video Solution

117. A metal M forms the sulphate $M_2(SO_4)_3$. $A0.596$ gram sample of the sulphate reacts with excess $BaCI_2$ to given $1.220gBaSO_4$. What is the atomic mass of M? (Atomic mass : $S = 32, Ba = 137.3$)

▶ Watch Video Solution

118. A silver coin weighing 11.34 g was dissolved in nitric acid When sodium chloride was added to the solution all the silver (present as $AgNO_3$) precipitated as silver chloride. The mass of the precipitated silver chloride was 14.35 g. Calculate the percentage of silver in the coin.

> ▶ **Watch Video Solution**

119. $100cm^3$ of a solution of an acid (Molar mass $= 98$) containing $29.4g$ of the acid per litre were completely neutralized by $90.0cm^3$ of aq. $NaOH$ containing $20g$ of $NaOH$ per $500cm^3$. The basicity of the acid is :

> ▶ **Watch Video Solution**

120. The concentration of an oxalic acid solution is x mol litre^-1. $40mL$ of this solution reacts with $16mL$ of $0.05M$ acidified $KMnO_4$. What is the pH of 'x' M oxalic acid solution ? (Assume that oxalic acid dissociates completely).)

> ▶ Watch Video Solution

Level 1 (Q.1 To Q.30)

1. Calculate number of neutrons present in 12×10^{25} atoms of oxygen $(8O^{17})$: (Given : $N_A = 6 \times 10^{23}$)

   A. 1800

   B. 1600

   C. $1800N_A$

   D. $3200N_A$

2. If mass of one atom is $3.32 \times 10^{-23} g$, then calculate number of nucleons (neutrons and protons) present in 2 atoms of the element:

A. 40

B. 20

C. 10

D. $40N_4$

3. Calculate number of electrons present in $9.5g$ of PO_4^{-3}:

A. 6

B. $5N_A$

C. $0.1N_A$

D. $4.7N_A$

4. What is the number of moles of O-atoms in 126 amu of HNO_3 ?

A. 2

B. $\dfrac{2}{N_A}$

C. $0.1N_A$

D. $\dfrac{6}{N_A}$

5. What is the charge of 96 amu of s^{2-} ?

A. 2C

B. $3.2 \times 10^{-19}C$

C. $9.6 \times 10^{-19}C$

D. 6 C

6. A sample of sodium has a mass of $46g$. What is the mass of the same number of calcium atoms as sodium atoms present in given sample ?

A. 46 g

B. 20 g

C. 40 g

D. 80 g

7. The total number of neutrons present in $54mLH_2O(l)$ are :

A. $3N_A$

B. $30N_A$

C. $24N_A$

D. None of these

8. Total number of electrons present in $48 gm G^{2+}$ are :

A. $24N_A$

B. $2N_A$

C. $20N_A$

D. None of these

9. The number of neutrons in 5g of D_2 $O(D$ is $._1^2 H)$

A. $0.25N_A$

B. $2.5N_A$

C. $1.1N_A$

D. None of these

10. Cisplatin, an anticancer drug, has the molecular formula $Pt(NH_3)_2Cl_2$. What is the mass (in gram) of one molecule ? (Atomic masses : $Pt = 195, H = 14, Cl = 35.5$)

A. 4.98×10^{-22}

B. 1.08×10^{-22}

C. 6.55×10^{-21}

D. 3.85×10^{-22}

11. Aspirin has the fromula $C_9H_8O_4$. How many atoms of oxygen are there in a tablet weighing $360mg$?

    A. 1.204×10^{23}

    B. 1.08×10^{22}

    C. 1.204×10^{24}

    D. 4.81×10^{21}

▶ **Watch Video Solution**

---

12. $20g$ of ideal gas contains only atoms of S and O occupies $5.6L$ at 1 atm and $273K$. what is the molecular mass of gas ?

    A. 64

    B. 80

    C. 96

D. None of these

13. A sample of ammonium phosphate, $(NH_4)_3PO_4$, contains 6 moles of hydrogen atoms. The number of moles of oxygen atoms in the sample is :

A. 1

B. 2

C. 4

D. 6

14. Total number of moles of oxygen atoms in 3 litre $O_3(g)$ at $27°C$ and 8.21 atm are :

A. 3

B. 1

C. 1

D. None of these

15. 3.011×10^{22} atoms of an element weighs $1.15gm$. The atomic mass of the element is :

A. $10a\mu$

B. $2.3a\mu$

C. $35.5a\mu$

D. $23a\mu$

16. One atom of an element x weighs $6.643 \times 10^{-23}g$. Number of moles of atoms in its $20kg$ is :

A. 4

B. 40

C. 100

D. 500

17. Mass of one atom of the element A is $3.9854 \times 10^{-23}g$. How many atoms are contained in 1g of the element A ?

A. 2.509×120^{23}

B. 6.022×10^{23}

C. 12.044×10^{23}

D. None of these

18. Which of the following contains the largest mass of hydrogen atoms ?

A) 5 mole C2H2O4 B) 1.1 Mole C3H8O3 C) 1.5 Mole C6H8O6 D) 4 Mole C2H4O2

A. 5.0   moles $C_2H_2O_4$

B. 1.1   moles $C_3H_8O_3$

C. 1.5   moles $C_6H_8O_6$

D. 4.0   moles $C_2H_4O_2$

19. Which has minnimum number of oxygen atom ?

A. 10 mL $H_2O(l)$

B. 0.1 mole $V_2O_5(s)$

C. 12 gm $O_3(g)$

D. 12.044×10^{22} molecules of CO_2

▶ **Watch Video Solution**

20. Rearrange the following (I to IV) in the order of increasing masses : A) 0.5 Mole of O3 B) 0.5g of oxygen C) 3.011 * 10^23 Molecules of O2 D) 5.6 Litres of CO2 at STP

A. $II < IV < III < I$

B. $II < I < IV < III$

C. $IV < II < III < I$

D. $I < II < III < IV$

21. If the volume of a drop of water is $0.0018 mL$ then the number of water molecules present in a drop of water at room temperature is :

    A. 12.046×10^{19}

    B. 1.084×10^{18}

    C. 4.48×10^{17}

    D. 6.023×10^{23}

22. It is known that atom contain protons. Neutrons and electrons. If the mass of neutron is assumed to half of its orginal value where as that of proton is assumed to be twice of its original value then the atomic mass of $._{6}^{14}C$ will be :-

A. same

B. 14.28 % less

C. 14.28 % more

D. 28.56 % less

23. Common salt obtained from sea-water contains $8.775 \% \ NaCl$ by mass. The number of formula units of $NaCl$ present in $25g$ of this salt is :

A. 3.367×10^{23} formula units

B. 2.258×10^{22} formula units

C. 3.176×10^{23} formula units

D. 4.73×10^{25} formula units

24. The number of hydrogen atoms present in $25.6g$ of sucrose $(C_{12}H_{22}O_{11})$ which has a molar mass of $342.3g$ is :

A. 22×10^{23}

B. 9.91×10^{23}

C. 11×10^{23}

D. 44×10^{23}

▶ Watch Video Solution

---

25. Caffiene has a molecular mass of 194. If it contains 28.9% by mass of nitrogen, number of atoms of nitrogen in one molecule of caffeine is :

A. 4

B. 6

C. 2

D. 3

26. The density of water is 1g/mL. Water is the volume occupied by 1 molecule of water ?

A. $1.44 \times 10^{-23} mL$

B. $1 mL$

C. $18 mL$

D. $2.88 \times 10^{-23} mL$

27. A $25.0mm \times 40.0mm$ piece of gold foil is $0.25mm$ thick. The density of gold is $19.32\frac{g}{c}m^3$. How many gold atoms are in the sheet ? (Atomic

weight : $Au = 197.0$)

A. 7.7×10^{23}

B. 1.5×10^{23}

C. 4.3×10^{21}

D. 1.47×10^{22}

28. If average molecular mass of air is 29, then assuming N_2 and O_2 gases are there, which options are correct regarding composition of air ?

i) 75% by mass of N_2 ii) 75% by moles N_2 iii) 72.41% by mass of N_2

A. only (i) is are correct

B. Only (ii) is correct

C. both (ii) and (iii) are correct

D. both (i) and (ii) are correct

29. Density of dry air containing ony N_2 and O_2 is $1.15\frac{g}{L}$ at $740mm$ of Hg and $300K$. What is % composition of N_2 by mass in the air ?

A. 78 %

B. 85.5 %

C. 70.02 %

D. 62.75 %

30. A gaseous mixture of H_2 and CO_2 gases contains 66 mass % of CO_2.

The vapour density of the mixture is :

A. 6.1

B. 5.4

C. 2.7

D. 10.8

▶ Watch Video Solution

Level 1 (Q.31 To Q.60)

1. A mixture contains N_2O_4 and NO_2 in the ratio 2:1 by volume. The vapour density of the mixture is:

▶ Watch Video Solution

2. Density of ideal gas at 2 atm and 600K is 2g/L. Calculate relative density of this with respect to Ne(g) under similar conditions : (given :

$$R = \frac{1}{12} atm \frac{L}{m} ol. K)$$

A. 2.5

B. 2

C. 3

D. 5

3. Average atomic mass of magnesium is 24.31amu. This magnesium is composed of 79 mole % of $24mg$ and remaining 21 mole % of $25mg$ and $25mg$. Calculate mole % of $26mg$.

A. 10

B. 11

C. 15

D. 16

4. Indium (atomic mass $= 114.82$) has two naturally occurring isotopes, the predominant one from has isotopic mass 114.9041 and abundance of 95.72 % . What is the mass for the other isotope ?

A. 112.94

B. 115.9

C. 113.9

D. 114.9

5. Calculate density of a gaseous mixture which consist of 3.01×10^{24} molecules of N_2 and $32g$ of O_2 gas at 3 atm pressure and $860K$ temperature (Given : $R = \dfrac{1}{2}$ atm $\dfrac{L}{m} o \leq . K)$

A. $0.6g/L$

B. $1.2g/L$

C. $0.3g/L$

D. $12g/L$

6. A mixture of O_2 and gas Y $(mol.\,wt.\,80)$ in the mole ratio $a:b$ has a mean molecular weight 40. What would be mean molecular weight, if the gases are mixed in the ratio $b:a$ under identical conditions ? (gases are)

A. 40

B. 48

C. 62

D. 72

7. If water sample are taken from sea, rivers or lake, they will be found to contain hydrogen and oxygen in the approximate ratio of $1:8$. This indicates the law of :

A. law of conseravtion of mass

B. Definite proporation

C. Reciprocal propoertions

D. None of these

8. Hydrogen and oxygen combine to from H_2O_2 and H_2O containing 5.93% and 11.2% hydrogen respectively . The data illustrates :

A. law of conservation of mass

B. law of constant proportion

C. law of reciprocal proportion

D. law of multiple proportion

Answer: 4

▶ Watch Video Solution

---

9. Which one the following combinations illustrate law of reciprocal proportions ?

A. N_2O_3, N_2O_4, N_2O_5

B. $NaCl, NaBr, NaI$

C. CS_2, CO_2, SO_2

D. PH_3, P_2O_3, P_2O_5

Answer: 3

▶ Watch Video Solution

10. Carbon and oxygen combine to form two oxides, carbon monoxide and carbon dioxide in which the ratio of the masses of carbon and oxygen is respectively $2:16$ and $12:32$. These figures illustrate the :

A. law of multiple proportions

B. law of reciprocal proportions

C. law of conservation of mass

D. law of constant proportains

▶ Watch Video Solution

11. A sample of calcium carbonate $(CaCO_3)$ has the following percentage composition : $Ca = 40\%$, $C = 12\%$, $O = 48\%$. If the law of constant proportions is true , then the mass of calcium in 4 g of a sample of calcium carbonate obtained from another source will be :

A. $0.016g$

B. $0.16g$

C. $1.6g$

D. $16g$

12. The law of multiple proportion is illustrated by the two compounds a) Sulphur dioxide and Sulphur trioxide :

A. Sodium chlordie and sodium bromide

B. Ordinary water and heavy water

C. Caustic soda caustic potash

D. Sulphur dioxide and sulphur trixoide

Answer: 4

13. All the substance listed below are fertilizers that contribute nitrogen to the soil. Which of these is the richest source of nitrogen on a mass percentage basis ? a) Urea b) Ammonia

A. Urea ,$(NH_2)_2CO$

B. Ammonium nitrate ,NH_4NO_3

C. Nitric oxide , NO

D. Ammonia , NH_3

14. One mole of element X has 0.444 times the mass of one mole of element Y. One atom of element X has 2.96 times the mass of one atom of 12_C. What is the atomic mass of y ?`

A. 80

B. 15.77

C. 46.67

D. 40

15. A given sample of pure compound cotains $9.81gm$ of Zn, 1.8×10^{23} atoms of chromium and 0.60 mole of oxygen atoms. What is the simplest formula ?

A. $ZnCr_2O_7$

B. $ZnCr_2O_4$

C. $ZnCrO_4$

D. $ZnCrO_6$

16. The formula of an acid is HXO_2. The mass of 0.0242 moles of the acid
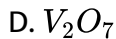
is $1.657g$. What is the atomic mass of X ?
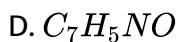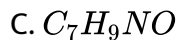
A. 35.5
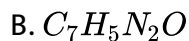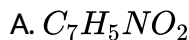
B. 28.1

C. 128

D. 19

▶ **Watch Video Solution**

---

17. What is the empirical formula of vanadium oxide if $2.74g$ of the metal

oxide contains $1.53g$ of metal ?

A. V_2O_3

B. VO

C. V_2O_5

D. V_2O_7

18. Determine the empirical fromula of kelvar, used in making bullet proof vests, is $70.6\ \%\ C$, $4.2\ \%\ H$, $11.8\ \%\ N$ and $13.4\ \%\ O$:

A. $C_7H_5NO_2$

B. $C_7H_5N_2O$

C. C_7H_9NO

D. C_7H_5NO

19. The hydrate salt $Na_2CO_3 . xH_2O$ undergoes $63\ \%$ loss in mass on heating and becomes anhydrous. The value of x is :

A. 10

B. 12

C. 8

D. 18

20. A $6.85g$ sample of the hydrated $Sr(OH)_2 . \, x \, H_2O$ is dried in an oven to given $3.13g$ of anhydrous $sr(OH)_2$. What is the value of x? (Atomic masses : $Sr = 87.60. \, O = 16.0, H = 1.0$)

A. 8

B. 12

C. 10

D. 6

21. What percentage of oxygen is present in the compound $CACO_{3.3}Ca_3(PO_4)_2$?

   A. 23.3 %

    B. 45.36 %

    C. 41.94 %

    D. 17.08 %

22. Deildrin, an insecticide, contains C, H, Cl and O. Combustion of $29.72mg$ of dieldrin gave $41.21 mgCO_2$ and $5.63mg$ of H_2O . In a separate analysis $25.31mg$ of dieldein was converted into $57.13mg$ Ag Cl. What is the empirical formula of diedrin ?

A. $C_6H_4Cl_3O$

B. C_8H_8ClO

C. $C_{12}H_8Cl_6O$

D. $C_6H_4Cl_3O_2$
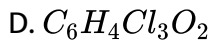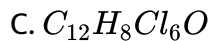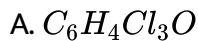
23. A gaseous compound is composed of 85.7% by mass carbon and 14.3% by mass hydrogen. Its density is 2.28 g/litre at $300K$ and 1.0 atm pressure. Determine the molecular formula of the compound.

A. C_2H_2

B. C_2H_4

C. C_4H_8

D. C_4H_{10}
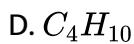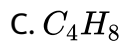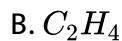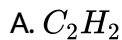
24. Complete combustion of $0.858g$ of compound X given $2.64g$ of CO_2 and 1.26 g of $H_{(2)}O$. The lowest molecular mass X can have:

A. 47 g

B. 86 g

C. 129 g

D. 172 g

25. The sulphate of a metal M contains 9.87% of M. This sulphate is isomorphous with $ZnSO_{4.7}H_2O$. The atomic mass of M is :

A. 40.3

B. 36.3

C. 24.3

D. 11.3

26. In an organic compound of molar mass $108 \, gmmol^{-1} \, C, H$ and N atoms are presents in $9:1:3.5$ by mass. Molecular formula can be

A. $C_6H_8N_2$

B. $C_7H_{10}N$

C. $C_5H_6N_3$

D. $C_4H_{18}N_3$
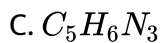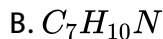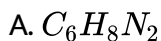
27. On analysis, a certain compound was found to contain 254g of iodine (at.mass 127) and 80g oxygen (at.mass 16). What is the formula of the compound ?

A. IO

B. I_2O

C. I_5O_3

D. I_(2)O_(5)`

28. An element A is teravalent and another element B is divalent. The formula of the compound formed from these elements will be :

A. A_2B

B. AB

C. AB_2

D. A_2B_3

29. A compound used in making nylon, contains $43.8\,\%$ oxygen. There are four oxygen atoms per molecule. What is the molecular mass of compound ?

A. 36

B. 116

C. 292

D. 146

30. Suppose two elements X and Y combine to form two compounds XY_2 and X_2Y_3 when 0.05 mole of XY_2 weight $5g$ while 3.011×10^{23} molecules of X_2Y_3 weight $85g$. The atomic masses of X and Y are respectively.

    A. 23,30

    B. 30,40

    C. 40,30

    D. 80,60

▶ **Watch Video Solution**

Level 1 (Q.61 To Q.90)

1. $44g$ of a sample on complete combustion given $88gCO_2$ and $36g$ of H_2O. The molecular formula of the compound may be :

    A. C_4H_9

B. C_2H_6O

C. C_2H_4O

D. C_3H_6O
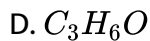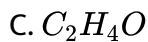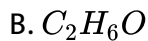
▶ Watch Video Solution

2. 40 miligram diatomic volatile substance (X_2) is converted to vapour that displaced $4.92mL$ of air at 1atm and 300k. Atomic mass of element X is nearly :

A. 400

B. 240

C. 200

D. 100

▶ Watch Video Solution

3. Two elements $X($ atomic weight $= 75)$ and $Y($ atomic weight $= 16)$ combine to give a compound having 75.8 % X.` The formula of the compound is

    A. XY

    B. X_2Y

    C. X_2Y_2

    D. X_2Y_3

▶ **Watch Video Solution**

---

4. A sample of phosphorus that weighs $12.4g$ exerts a pressure 8 atm in a 0.821 litre closed vesel at $527°C$. The molecular formula of the phosphorus vapour is :

    A. P_2

    B. P_4

C. P_6

D. P_8

5. Manganese forms non-stoichiometric oxides having the gereral formula formula MnO_x. The value of x for the compound that analyzed 64% by mass mn :

A. 1.16

B. 1.83

C. 2

D. 1.93

6. 1. 44 gram if titanium (Ti) reacted with excess of O_2 and produce x gram of non $-$ stoichiometric compound $Ti_{1.44}O$. The value of x is :

A. 2

B. 1.77

C. 1.44

D. None of these

7. Which statement is false for the balanced equation given below ?

$CS_2 + 3O_2 \rightarrow 2SO_2 + CO_2$
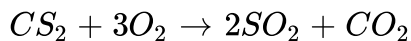
A. One mole of CS_2 will produce one mole of CO_2

B. The reaction of 16 g of oxygen produces $7.33g$of CO_2

C. The raction of one mole of O_2 will produce $2/3$ "mole of" SO_2

D. Six molecules of oxygen requires threee molecular of CS_2

8. Which of the following statements is correct ?

A.

$$0.150 \quad \text{moles} \quad Cl_2 \times 1\text{mole} \quad KClO_3/3\text{moles} Cl_2 \times 122.5g/1$$

B.

$$0.150 \quad \text{moles} \quad Cl_2 \times 1\text{mole} \quad KClO_3/3\text{moles} Cl_2 \times 1\text{mole}$$

C.

$$0.150 \text{ moles} \quad Cl_2 \times 3\text{moles} \quad Cl_2/1 \text{ mole } KCLO_3 \times 122.5g/1\text{m}$$

D.

$$0.150 \text{ moles} \quad Cl_2 \times 3\text{moles} \quad Cl_2/1 \text{ mole } KCLO_3 \times 1\text{mole} \quad K$$

9. $2.0g$ of a sample contains mixture of SiO_2 and Fe_2O_3. On very strong heating, it leaves a residue weighing $1.96g$. The reaction responsible for loss of mass is given below. $Fe_2O_3(s) \rightarrow Fe_3O_4(s) + O_2(s)$, (unbalance equation) what is the percentage by mass of SiO_2 in original sample ?

A. 10 %

B. 20 %

C. 40 %

D. 60 %

▶ **Watch Video Solution**

---

10. What volume of air at 1 atm and $273K$ containing 21% of oxygen by volume is required to completely burn sulphur (S_8) present in $200g$ of sample , which contains 20% inert material which does not burn. Sulphur burns according to the reaction $\frac{1}{8}S_8(s) + O_2(g) \rightarrow SO_2(g)$

A. 23.52 litre

B. 320 litre

C. 112 litre

D. 533.33 litre

---

11. For the reaction, $2Fe(NO_3) + 3Na_2CO \rightarrow Fe_2(CO_3)_3 + 6NaNO_3$ initially 2.5 mole of $Fe(NO_3)_3$ and 3.6 mole of Na_2CO_3 are taken. If 6.3 mole of $NaNO_3$ is obtained then % yield of given reaction is :

A. 50

B. 84

C. 87.5

D. 100

12. How many of P_4 can be produced by reaction of 0.10 moles $Ca_5(PO_4)_3F$, 0.36 moles SiO_2 and 0.90 moles C according to the following reaction ?

$$4Ca_5(PO_4)_3F + 18SiO_2 + 30C \rightarrow 3P_4 + 2CaF_2 + 18CaSiO_3 + 30CO$$
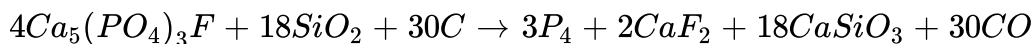
A. 0.060

B. 0.030

C. 0.045

D. 0.075

▶ Watch Video Solution

13. Some older emergency oxygen masks contains potassium superoxide KO_2 which reacts with CO_2 and water present in exhaled air to produce oxygen according to the given equation. If a person exhales $0.667g$ of CO_2 per minute, how many gram of KO_2 are consumed in 5.0 minutes ?

A. 10.7

B. 0.0757

C. 1.07

D. 5.38

▶ Watch Video Solution

---

14. The mass of N_2F_4 produced by the reaction of 2.0 g of NH_3 and 8.0 g F_2 is 3.56 g. What is the per cent yield ?

A. 79

B. 81.2

C. 84.6

D. None of these

▶ Watch Video Solution

15. Calculate the weight of lime (CaO) obtained by heating 200 kg of 95% pure lime stone $(CaCO_3)$.

A. $104.4kg$

B. $105.4kg$

C. $212.8kg$

D. $106.4kg$

16. Phospheric acid (H_3PO_4) perpared in two step process .

(1) $P_4 + 5O_2 \rightarrow P_4O_{10}$ (2) $P_4O_{10} + 6H_2O \rightarrow 4H_3PO_4$
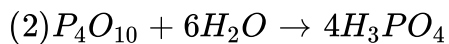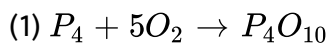
Well allow 62 g of phosphrous to react with exces oxygen which from P_4O_{10} in 85% yield . In the sep (2) reaction 90% yield of $H_3)PO_4$ is obtained . Mass of H_3PO_4 produced is :

A. $37.485g$

B. $149.949g$

C. $125.47g$

D. $564.48g$

17. 9 moles of "D" and 14 moles of E are allowed to react in a closed vessel according to given reactions. Calculate number of moles of B formed in the end of reaction, if 4 moles of G are present in reaction vessel. (percentage yield of reaction is mentioned in the reaction) Step -1 $3D + 4E \xrightarrow{80\%} 5C + A$ Step-2 $3C + 5G \xrightarrow{50\%} 6B + F$

A. 2.4

B. 30

C. 4.8

D. 1

Watch Video Solution

---

18. The chief ore of Zn is the sulphide ZnS. The ore is concentrated by froth floatation process and then heated in air to convert ZnS to ZnO.

$2ZnS + 3O_3 80\% \rightarrow 2ZnO + 2SO.$ ZnO+H_2SO_4 100% rarr Zn

SO_4+H_2O and 2ZnSO_4+2H_2O 80% rarr 2Zn+2Hn+2H_2SO_4+O_2
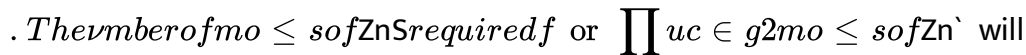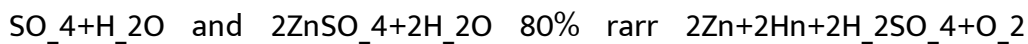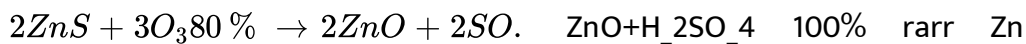
. $The vmber of mo \le sof ZnS required f$ or $\prod uc \in g 2 mo \le sof Zn$ will

be :

A. 3.125

B. 2

C. 2.125

D. 4

Watch Video Solution

19. 0.8 moles of a mixture of CO and CO_2 requires exactly 40 gram of $NaOH$ in solution for complete conversion of all the CO_2 into Na_2CO_3. How many more of $NaOH$ would for require for conversion into Na_2CO_3 if the mixture (0.8 mole) is completely oxidised to CO_2 ?

A. 0.2

B. 0.6

C. 1

D. 1.5

20. Silver oxide (Ag_2O) decomposes at temperature $300°C$ yielding matellic silver and oxygen gas. A $1.60g$ sample of impure silver oxide yields $0.104g$ of oxygen gas. What is the per cent by mass of the silver oxide in the sample ?

A. 5.9

B. 47.125

C. 94.25

D. 88.2

21. Comprehension # 5

$342g$ of 20% by mass of $Ba(OH)_2$ solution $(sp.\ gr.0.57)$ is reacted with $1200mL$ of $2MHNO_3$ according to given balanced reaction :

$$Ba(OH)_2 + 2HNO_3 \rightarrow Ba(NO_3)_2 + 2H_2O$$
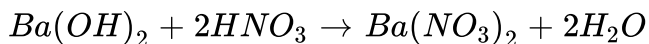
Find the molarity of the ion in resulting solution by which nature of the above solution is identified, is

A. 0.25

B. $0.5M$

C. $0.888M$

D. None of these

22. $100mL$ of H_2SO_4 solution having molarity $1M$ and density $1.5g/mL$ is mixed with $400mL$ of water. Calculate final molarity of H_2SO_4 solution, if final density is $1.25g/mL$?

A. $4.4M$

B. $0.145M$

C. $0.52M$

D. $0.227M$

23. What volume of HCI solution of density $1.2\frac{g}{c}m^3$ and containing 36.5% by mass HCI, must be allowed to react wtih zinc (Zn) in order to liberate $4.0g$ of hydrogen ?

A. $333.33mL$

B. $500mL$

C. $614.66mL$

D. None of these

▶ **Watch Video Solution**

24. An ideal gaseous mixture of ethane (C_2H_6) and ethene (C_2H_4) occupies 28 litre at $1atm$ $0°C$. The mixture reacts completely with $128gmO_2$ to produce CO_2 and H_2O. Mole of fraction at C_2H_6 in the mixtture is-

A. 0.6

B. 0.4

C. 0.5

D. 0.8

---

25. Wood's metal contains 50.0% bismuth, 25.0% lead, 12.5% tin and 12.5% cadmium by mass. What is the mole fraction of tin ?(\ (Atomic mass : $Bi = 209, Pb = 207, Sn = 119, Cd = 112$)

A. 0.202

B. 0.158

C. 0.176

D. 0.221

26. The density of a 56.0% by mass aqueous solution of 1-propanol $(CH_3CH_2CH_2OH)$ is $0.8975\frac{g}{c}m^3$. What is the mole fraction of the 1-propanol ?

A. 0.292

B. 0227

C. 0.241

D. 0.276

▶ **Watch Video Solution**

---

27. What is the molartiy of SO_4^{2-} ion in aqueous solution that contain 34.2 ppm of $AI_2(SO_4)_3$? (Assume complete dissociation and density of solution $1\frac{g}{m}L$)

A. $3 \times 10^{-4}M$

B. 2×10^{-4}

C. $10^{-4}M$

D. None of these

28. The relation between molarity (M) and molality (m) is given by : (p=density of solution (g/mL), M_1= molecular mass of solute)

A. $m = \dfrac{1000M}{1000\rho - M_1}$

B. $m = \dfrac{1000\rho M}{1000\rho - MM_1}$

C. $m = \dfrac{1000MM}{1000\rho - MM_1}$

D. $m = \dfrac{1000M}{1000\rho - MM_1}$

29. Molarity and molality of a solution of an liquid (mol.mass $= 50$) in aqueous solution is 9 and 10 respectively. what is the density of solution ?

A. $1g/cc$

B. $0.95g/cc$

C. $1.05g/cc$

D. $1.35g/cc$

▶ **Watch Video Solution**

---

30. An aqueous solution of ethanol has density 1.025 g/mL and it is 2 M. What is the molality of this solution ?

A. 1.79

B. 2.143

C. 1.951

D. None of these

Level 1 (Q.91 To Q.120)

1. 0.2 mole of HCl and 0.2 mole of barium chloride were dissolved in water to produce a $500 mL$ solution. The molarity of the $Cl-$ ions is :

A. $0.06 M$

B. $0.09 M$

C. $1.2 M$

D. $0.80 M$

2. Calculate the mass of anhyrous HCI in $10mL$ of concentrated HCI (density $= 1.2\dfrac{g}{m}L$) solution having 37% HCI by mass is :

A. $4.44g$

B. $4.44mg$

C. 4.44×10^{-3}

D. $0.444\mu g$

▶ **Watch Video Solution**

3. Calculate the molality of 1L solution of 80% $H_2SO_4\left(\dfrac{w}{V}\right)$ given that the density of the solution is $1.80gmL^{-1}$.

A. 8.16

B. 8.6

C. 1.02

D. 10.8

4. Fluoxymesterone, $C_{10}H_{29}FO_3$, is an anabolic steroid. A 500 mL solution is prepared by dissolving $10.0mg$ of the steoid in water. $10.0mL$ portion of this solution is diluted to a final volume of $1.00L$. what is the resulting molarity ?

A. 1.19×10^{-10}

B. 1.19×10^{-7}

C. 5.95×10^{-8}

D. 2.38×10^{-11}

5. The $25mL$ of a 0.15M solution of lead nitrate, $Pb(NO_3)_2$ reacts with all of the aluminium sulphate, $Al_2(SO\_4)\_3, present \in 20$ mL $of a solution. W \hat{i} s the molar concentration of the Al\_2(SO\_4)\_3$?

3Pb(NO_3)_2(aq)+Al_2(SO_4)_3(aq)rarr3PbSO_4(s)+2Al(NO_3)_3(aq)`
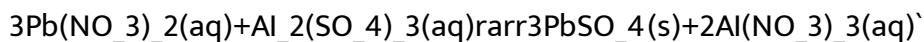
A. $6.25 \times 10^{-2}M$

B. $2.421 \times 10^{-2}M$

C. $0.1875M$

D. None of these

> ▶ **Watch Video Solution**

6. Concentrated HNO_3 is $63\% HNO_3$ by mass and has a density of $1.4\frac{g}{m}L$. How many millilitres of this solution are required to prepare $250mL$ of a $1.20MHNO_3$ solution ?

A. 18.0

B. 21.42

C. 20.0

D. 14.21

▶ Watch Video Solution

---

7. $50mL$ of 20.8% (w/V) $BaCI_2$ (aq) and $100mL$ of 9.8% mL(w/V) H_2SO_4(aq) solutions are mixed. Molarity of Cl^- ion in the resulting solution is : (At mass of $Ba = 137$)

A. 0.333M

B. 0.666M

C. 0.1M

D. 1.33M

Answer: B

▶ Watch Video Solution

8. $100mL$ of 10% $NaOH\left(\dfrac{w}{V}\right)$ is added to $100mL$ of 10% $HCI\left(\dfrac{w}{V}\right)$.

The nature of resultant solution is :

    A. alkaline

    B. strongly alkaline

    C. acidic

    D. neurtal

Answer: C

▶ **Watch Video Solution**

---

9. How many millilitres of $0.1M H_2SO_4$ must be added to $50mL$ of $0.1M NaOH$ to give a solution that has a concentration of $0.05M$ in H_2SO_4 ?

    A. 400mL

B. 200mL

C. 100mL

D. none of these

Answer: C

▶ Watch Video Solution

10. $1MHCI$ and $2MHCI$ are mixed are mixed in volume ratio of $4:1.$ What is the final molarity of HCI solutions ?

A. 1.5

B. 1

C. 1.2

D. 1.8

Answer: C

▶ Watch Video Solution

11. Three solutions X,Y,Z of HCl are mixed to produce 100mL of 0.1M solution . The molarities of X,Y and Z are 0.7M, 0.12M and 0.15M respectively. What respective volumes of X,Y and Z should be mixed?

A. $50mL, 25mL, 25mL$

B. $20mL, 60mL, 20mL$

C. $40mL, 30mL, 30mL$

D. $55mL, 20mL, 25mL$

Answer: D

▶ Watch Video Solution

12. A bottle of an aqueous H_2O_2 solution is labelled as $'28V'H_2O_2$ and the density of the solution $\left(\in \frac{g}{m}L \right)$ is 1.25. Choose the corrects option : A) Molality of H2O2 is 2 B) Molarity of H2O2 is 5 C) Molality of H2O2 is 2.15 D) None of these

A. Molarity of H_2O_2 solution is2

B. Molarity of H_2O_2 solution is5

C. Molarity of H_2O_2 solution is2.15

D. none of these

Answer: C

▶ **Watch Video Solution**

13. The impure $6g$ of $NaCI$ is dissolved in water and then treated with excess of silver nitrate solution. The mass of precipitate of silver chloride is found to be $14g$. The % purity of `NaCl solution would be :

A. 0.95

B. 0.85

C. 0.75

D. 0.65

Answer: A

14. $AI_2(SO_4)_3$ solution of 1 molal concentration is present in 1 litre solution of density $2.684\dfrac{g}{m}l$. How many moles of $BaSO_4$ would be precipitated on adding excess of $BaCI_2$ in it ?

   A. 2 moles

   B. 3 moles

   C. 6 moles

   D. 12 moles

Answer: C

15. A certain public water supply contains $0.10ppb$ (part per billion) of chloroform $(CHCI_3)$. How many molecules of $CHCI_3$ would be obtained in $0.478mL$ drop of this water ?(assumed $d = 1\dfrac{g}{m}L$)

A. $4 \times 10^{-13} \times N_A$

B. $10^{-3} \times N_A$

C. $4 \times 10^{-10} \times N_A$

D. none of these

Answer: A

> ▶ **Watch Video Solution**

16. Decreasing order (first having highest and then other following it) of

mass of pure NaOH in each of the aqueous solution

(P) 50 gm of $40\ \%\ (w/w)$ NaOH

(Q) 50 gm of $50\ \%\ (w/V)$ NaOH $[d_{\text{soln.}} = 1.2gm/ml]$

(R) 50 gm of 20 M NaOH $[d_{\text{soln.}} = 1gm/ml]$

A. I,ii,iii

B. iii,ii,i

C. ii,iii,i

D. ii,I,iii

Answer: B

▶ Watch Video Solution

17. What is the molar mass of diacidic organic Lewis base (B), if $12g$ of its chloroplatinate salt (BH_2PtCI_6) on ignition produced $5g$ residue of Pt?

A. 52

B. 58

C. 88

D. none of these

Answer: B

18. On strongs heating, One gram of the silver salt of an organic dibasic acid yields $0.5934g$ of silver. If the mass percentage of carbon in it 8 times the mass percentage of hydrogen and one - half the mass percentage of oxygen, determine the molecular formula of the acid.

A. $C_4H_6O_4$

B. $C_4H_6O_6$

C. $C_4H_6O_2$

D. $C_5H_{10}O_5$
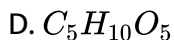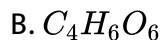
Answer: B

19. $0.607g$ of a silver salt of tribasic organic acid was quantitatively reduced to $0.37g$ of pure Ag. What is the molecular mass of the acid ?

20. A sample of peanut oil weighing 2g is added to $25mL$ of $0.40MKOH$. After saponification is complete, $8.5mL$ of $0.28MH_2SO_4$ is needed to nuetralize excess of KOH. The saponification number of peanut oil is :

(saponification number is defined as the milligrams of KOH consumed by 1g of oil)

A. 146.72

B. 223.44

C. 98.44

D. 98.9

Answer: A

21. $20mL$ of a mixture of CO and H_2 were mixed excess of O_2 and exploded & cooled. There was a volume contraction of 18mL. All volume measurements corresponds to room temperature $(27°C)$ and one atmospheric pressure. Determine the volume ratio $(V_1 : V_2 \text{of} CO$ anf H_2 in the original mixture .

A. $1:2$

B. $3:2$

C. $2:3$

D. $4:1$

Answer: B

▶ Watch Video Solution

---

22. In the reaction $2Al(s) + 6HCl(aq) \rightarrow 6Cl^-(aq) + 3H_2$

A. $6LHCl(aq)$ is consumed for every $3LH_2(g)$ produced

B. 33.6L $H_2(g)$ is produced regardless of temperature and pressure

for every mole Al that reacts

C.

$67.2LH_2 at 1atm$ and $273K$ is produced for every mole Al that reacts

D. 11.2L $H_2(g)$ at 1 atm and 273K is produced for every mole HCl(aq)

consumed

Answer: D

▶ **Watch Video Solution**

---

23. The percentage by volume of C_3H_8 in a gaseous mixture of

C_3H_8, CH_4 and CO is 20. When $100mL$ of the mixture is burnt in excess

of O_2 the volume of CO_2 produced is :

A. 173 mL

B. 160mL

C. 140mL

D. none of these

Answer: C

▶ Watch Video Solution

24. $40mL$ gaseous mixture of CO, CH_4 and Ne was exploded with $10mL$ of oxygen. After treatment with KOH the volume reduced by $9mL$ and again on treatment with alkaline pyrogallol, the volume further reduced by 1.5 mL. percentage of CH_4 in the original mixture is :

A. 22.5

B. 77.5

C. 7.5

D. 15

Answer: D

▶ Watch Video Solution

25. A gaseous mixture of propane and butane of volume 3 litre on complete combustion produces 11.0 litre CO_2 under standard conditions of temperature and pressure. The ratio of volume of butane to propane is :

    A. $1:2$

    B. $2:1$

    C. $3:2$

    D. $3:1$

Answer: B

26. Phosphorous has the oxidation state of $+1$ in :

    A. Orthophosphoric acid

B. Phosphorous acid

C. Hypophosphoric acid

D. Metaphosphiric acid

Answer: C

▶ **Watch Video Solution**

---

27. The oxidation state (s) of CI in $CaOCI_2$ (bleaching powder) is/are :

A. $+1 only$

B. $-1 only$

C. $+1 \ and \ -1$

D. none of these

Answer: C

▶ **Watch Video Solution**

28. The oxidation number of sulphur in S_8, S_2F_2, H_2S and H_2SO_4 respectively are :

   A. $0, +1, -2$ and 6

   B. $+2, 0, +2$ and 6

   C. $0, +1, +2$ and 6

   D. $-2, 0, +2$ and 6

Answer: A

▶ **Watch Video Solution**

---

29. Fe shows an oxidation state of $+1$ in :

   A. $Fe(CO)_5$

   B. $\left[Fe(H_2O)_5NO\right]SO_4$

   C. $Fe_4\left[Fe(CN)_6\right]_3$

   D. $Fe_4Cl_4^-$

Answer: B

---

30. When SO_2 is passed into an acidified potassium dichromate solution, the oxidation numbers of sulphur and chromium in the final products respectively are :

    A. $+6, \ +6$

    B. $+6, \ +3$

    C. $+0, \ +3$

    D. $+2, \ +3$

Answer: B

Level 1 (Q.121 To Q.150)

1. The oxidation number of nitrogen atoms in NH_4NO_3 are :

A. $+3,\ +3$

B. $+3,\ -3$

C. $-3,\ -5$

D. $-5,\ +3$

Answer: C

▶ Watch Video Solution

2. The oxidation state of S-atoms in Caro's and Marshall's acids are :

A. $+6,\ +6$

B. $+6,\ +4$

C. $+6,\ -6$

D. $+4,\ +6$

Answer: A

3. What is the oxidation number of Mn in Potassium Permanganate ?

4. The oxidation numbers of oxygen in KO_3, Na_2O_2 respectively are :

A. 3,2

B. 1,0

C. 0,1

D. $-0.33, \ -1$

Answer: D

5. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is :

A. -1

B. $+1$

C. $+2$

D. $+3$

Answer: B

▶ **Watch Video Solution**

---

6. If it is known that $Fe_{0.96}O$, Fe is present in $+2$ and $+3$ oxidation state, What is the mole fraction of Fe^{2+} in the compound ?

A. $\dfrac{12}{25}$

B. $\dfrac{25}{12}$

C. $\dfrac{1}{12}$

D. $\dfrac{11}{12}$

Answer: D

7. Which of the following sequence of compounds is according to the decreasing order of the oxidation state of nitrogen ?

A. HNO_3, NO, NH_4Cl, N_2

B. HNO_3, NO, N_2, NH_4Cl

C. HNO_3, NH_4Cl, NO, N_2

D. NO, HNO_3, NH_4Cl, N_2
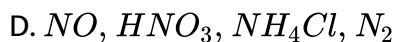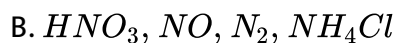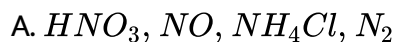
Answer: B

8. 2 mole of N_2H_4 loses 16 mole of electron is beings converted to a new compound X. Assuming that all of the N appears in the new compound.

What is the oxidation state of 'N' in X ?

A. -1

B. -2

C. $+2$

D. $+4$

Answer: C

▶ Watch Video Solution

---

9. When $K_2Cr_2O_7$ is converted to K_2CrO_4 then change in the oxidation

state of chromium is :

A. 0

B. 6

C. 4

D. 3

Answer: A

10. When a manganous salt is fused with a mixture of KNO_3 and solid $NaOH$, the oxidation number of Mn change from $+2$ to :

A. $+4$

B. $+3$

C. $+6$

D. $+7$

Answer: C

11. In $Fe(II) - MnO_4^-$ titration, HNO_3 is not used because :

A. it oxidises Mn^{2+}

B. it reduces MnO_4^-

C. it oxidise Fe^{2+}

D. it reduces Fe^{3+} formed

Answer: C

▶ **Watch Video Solution**

12. Which species are oxidised and reduced in the reaction?

$$FeC_2O_4 + KMnO_4 \rightarrow Fe^{3+} + CO_2 + Mn^{2+}$$
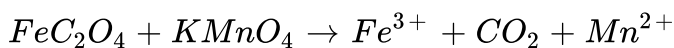
A. Oxidised: Fe, C, Reduced: Mn

B. Oxidised: Fe, Reduced: Mn

C. Reduced: Fe, Mn,Oxidised: C

D. Reduced: C,Oxidised: Mn, Fe

Answer: A

13. In which of the following reactions, H_2O_2 is acting as a reducing agent?

    A. $SO_2 + H_2O_2 \rightarrow H_2SO_4$

    B. $2KI + H_2O_2 \rightarrow 2KOH + I_2$

    C. $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

    D. $Ag_2O + H_2O_2 \rightarrow 2Ag + H_2O + O_2$
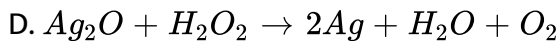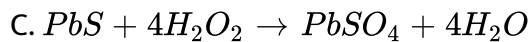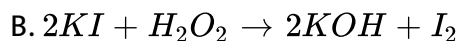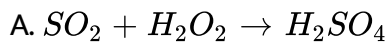
Answer: D

14. Following reaction describes the rusting of iron

$4Fe + 3O_2 \rightarrow 4Fe^{3+} + 6O^{2-}$
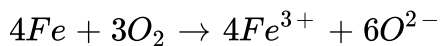
Which one of the following statements is incorrect?

A. This is an example of a redox reaction

B. Metallic iron is reduced to Fe^{2+}

C. Fe^{3+} is an oxidising agent

D. Metallic iron is a reducing agent

Answer: B

▶ Watch Video Solution

15. Which reaction does not represent auto redox or disproptionation?

A. $Cl_2 + OH^- \rightarrow Cl^- + ClO_3^- + H_2O$

B. $2H_2O_2 \rightarrow H_2O_2$

C. $2Cu^+ \rightarrow Cu^{2+} + Cu$

D. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$
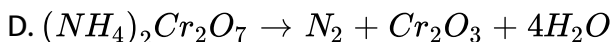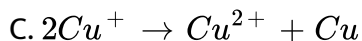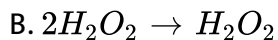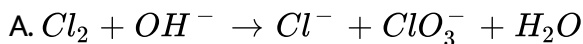
Answer: D

▶ Watch Video Solution

16. Which of the following is redox reaction ?

A. H_2SO_4 reach with NaOH

B. In atmoshere, O_3 is formed from O_2 by lightning

C. Evaporation of H_2O

D. Oxides of nitrogen are formed form nitrogen & oxygen by lightning

Answer: D

▶ **Watch Video Solution**

17. Which of the following is redox reaction?

A. $2Na\left[Ag(CN)_2\right] + Zn \rightarrow Na_2\left[Zn(CN)_4\right] + 2Ag$

B. $BaO_2 + H_2SO_4 \rightarrow BaSO_4 + H_2O_2$

C. $N_2O_5 + H_2O \rightarrow 2HNO_3$

D. $AgNO_3 + KI \rightarrow AgI + KNO_3$

Answer: A

---
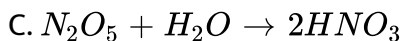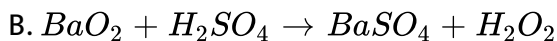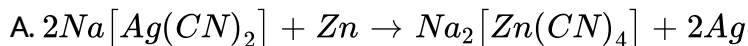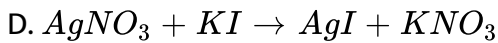
18. For the redox reation

$$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} CO_2 + H_2O$$
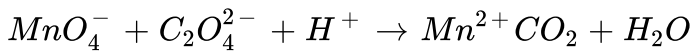
The correct stoichiometric coefficients of Mno_4^-, $C_2O_4^{2-}$ and H^+ respectively:

A. 2,16,5

B. 16,5,2

C. 5,16,2

D. 2,5,16

Answer: A

19. In the chemical reaction,

$$K_2Cr_2O_7 + xH_2SO_4 + ySO_2 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + zH_2O$$
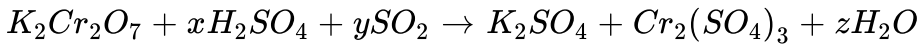
$x, y,$ and z are

    A. x=1,y=3,z-=1

    B. x=4,y=1,z=4

    C. x=3.y=2.z=1

    D. x=2.y=2,z=1

Answer: A

▶ **Watch Video Solution**

---

20. Balance the followings equations and choose the quantity which is the sum of the coeffficients of reactants and products :

$$..... \, CS_2 + ... \, Cl_2 \rightarrow ......Cl_4..... \, . \, S_2Cl_2$$
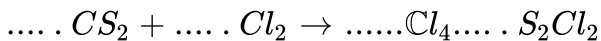
    A. 5

B. 3

C. 6

D. 2

Answer: D

▶ Watch Video Solution

21. Balance the followings equations and choose the quantity which is the sum of the coefficients of reactants and products :

$$....... . PtCI_4 + ... XeF_2 gives PtF_6 + ...CIF + ... Xe$$
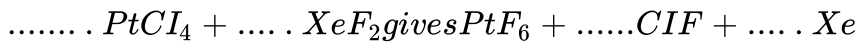
A. 16

B. 13

C. 18

D. 12

Answer: A

22. If 0.1 mole H_3PO_x is completely neutralised by 5.6g KOH then select the true statement.

    A. x=3 and given acid is diabasic

    B. x=4 and given acid has no P=H linkage

    C. x=2 and given acid does not form acid salt

    D. all of these

Answer: C

23. When potassium permanganate is titrated against ferrous ammonium sulphate in acidic medium, the equivalent mass potassium permanganate is ,

A. $\dfrac{\text{molecular mass}}{3}$

B. $\dfrac{\text{molecular mass}}{5}$

C. $\dfrac{\text{molecular mass}}{2}$

D. $\dfrac{\text{molecular mass}}{10}$

Answer: B

▶ **Watch Video Solution**

24. Equivalent mass of FeS_2 inthe half reaction, $FeS_2 \rightarrow Fe_2O_3 + SO_2$

is :

A. $\dfrac{M}{10}$

B. $\dfrac{M}{11}$

C. $\dfrac{M}{6}$

D. $\dfrac{M}{1}$

Answer: B

25. What is the oxidation number of Cr in Potassium Dichromate ?

A. +6

B. +3

C. -2

D. -6

Answer: D

26. Equivalent weight of H_3PO_2 when it disproportionates into PH_3 and H_3PO_3 is (mol.wt. of $H_3PO_2 = M$)

A. M

B. $\dfrac{M}{2}$

C. $\dfrac{M}{4}$

D. $\dfrac{3M}{4}$

Answer: D

▶ Watch Video Solution

---

27. In the following reaction,
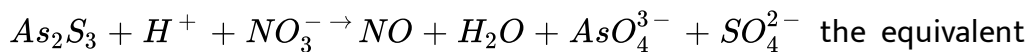
$As_2S_3 + H^+ + NO_3^- \rightarrow NO + H_2O + AsO_4^{3-} + SO_4^{2-}$ the equivalent mass of As_2S_3 is related to its molecular mass by :

A. $\dfrac{M}{2}$

B. $\dfrac{M}{4}$

C. $\dfrac{M}{24}$

D. $\dfrac{M}{28}$

Answer: D

▶ Watch Video Solution

28. Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is :

A. 8g/mol

B. 16g/mol

C. 64.8g/mol

D. 3g/mol

Answer: B

▶ **Watch Video Solution**

29. The equaivalent mass of an element is 4. Its chloride has a vapour density 59.25. Then, the velency of the elements is :

A. 4

B. 3

C. 2

D. 1

Answer: B

▶ **Watch Video Solution**

---

30. 6×10^{-3} mole $K_2Cr_2C_7$ reacts completely with 9×10^{-3} mole X^{n+} to give XO_3^- and Cr^{3+}. The value of n is :

A. 1

B. 2

C. 3

D. none of these

Answer: A

▶ **Watch Video Solution**

1. What mass of $H_2C_2O_4 . 2H_2O(mol. mass = 126)$ should be dissoved in water to prepare 250mL of centinormal solution which act as a reducing agent?

    A. 0.63g

    B. 0.1575g

    C. 0.126g

    D. 0.875g

Answer: B

▶ **Watch Video Solution**

2. The equivalent weight of salt

$KHC_2O_4 . H_2C_2O_4 . 4H_2O$ when used as reducing agent : −

    A. $\dfrac{\text{Mol.mass}}{1}$

B. $\dfrac{\text{Mol.mass}}{2}$

C. $\dfrac{\text{Mol.mass}}{3}$

D. $\dfrac{\text{Mol.mass}}{4}$

Answer: D

▶ **Watch Video Solution**

---

3. The eequivalent mass of divalent metal is W. The molecular mass of its chloride is :

A. W+35.6

B. W+72

C. 2W+72

D. 2W+35.6

Answer: C

▶ **Watch Video Solution**

4. When BrO_3^- iron reacts with Br^- in acid medium, Br_2 is liberated. The equivalent mass of Br_2 in this reaction is :

A. $\dfrac{5M}{8}$

B. $\dfrac{5M}{3}$

C. $\dfrac{3M}{5}$

D. $\dfrac{4M}{6}$

Answer: C

▶ **Watch Video Solution**

---

5. If m_A gram of a metal A displaces m_B gram of another metal B from its salt solution and if the equilvalent mass are E_A and E_B respectively then equivalent mass of A can be expressed as:

A. $E_A = \dfrac{m_A}{m_B} \times E_B$

B. $E_A = \dfrac{m_A \times m_B}{E_B}$

C. $E_A = \dfrac{m_B}{E_A} \times E_B$

D. $E_A = \sqrt{\dfrac{m_A}{m_B} \times E_B}$

Answer: A

▶ **Watch Video Solution**

6. Hydrazine reacts with KIO_3 in presence of HCl as :

$$N_2H_4 + IO_3^- + 2H^+ + Cl^- \rightarrow ICI + N_2 + 3H_2O$$
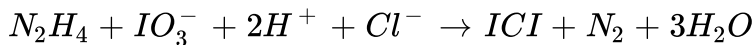
The equivalent masses of N_2H_4 and KIO_3 respectively are :

A. 8 and 53.5

B. 16 and 53.5

C. 8 and 35.6

D. 8 and 87

Answer: A

7. What will be the normality of solution obtained by mixining $0.45N$ and $0.60N NaOH$ in the ratio $2:1$ by volume ?

A. 0.4N

B. 0.5N

C. 1.05N

D. 0.15N

Answer: B

8. A solution contaning $2.7 \times 10^{-3} mol of A^{2+}$ ion required $1.6 \times 10^{-3} mol of MnO_4^{2-}$ for the oxidation of $A^{2+} to AO_3^-$ the medium is:

A. neutral

B. acidic

C. strong basic

D. none of these

Answer: B

▶ **Watch Video Solution**

---

9. H_2O_2 is used as bleaching reagent because on dissociation it givens oxygen $\left(H_2O_2 \rightarrow H_2O + \dfrac{1}{2}O_2 \right)$. Chachi 420 used H_2O_2 solution to bleach her hair and she required $2.24LO_2$ gas at 1 atm and $273K$. She has a H_2O_2 solution labelled as $5.6V$ then What volume of such solution must she required to bleach har hair ?

A. 200mL

B. 300mL

C. 400mL

D. 500mL

Answer: C

> ▶ **Watch Video Solution**

---

10. $1.25g$ of a solid dibasic acid is completely neutralised by $25mL$ of 0.25 molar Ba $(OH)_2$ solution. Molecular mass of the acid is :

A. 100

B. 150

C. 120

D. 200

Answer: D

> ▶ **Watch Video Solution**

11. $10mL$ of an $N - HCI$, $20mL$ of $\dfrac{N}{2}H_2SO_4$ and $30mL$ of $\dfrac{N}{3}HNO_3$ are mixed together and volume made to one litre. The normality of H^+ in the resulting solution is :

A. 3N/100

B. N/10

C. N/20

D. N/40

Answer: A

▶ Watch Video Solution

12. $0.45g$ of acid (mol. Wt. $= 90$) was exactly neutralized by $20ml$ of $0.5(M)NaOH$.

The basicity of the given acid is

A. 1

B. 2

C. 3

D. 4

Answer: B

▶ Watch Video Solution

13. A sample of 28 mL of $H_2 O_2$ (aq) solution required 10 mL of 0.1 M $KMnO_4$ (aq) solution for complete reaction in acidic medium. What is the volume strength of H_2O_2 ? X

A. 1

B. 0.5

C. 0.4

D. 0.2

Answer: C

14. Which species are oxidised and reduced in the reaction?

$$FeC_2O_4 + KMnO_4 \rightarrow Fe^{3+} + CO_2 + Mn^{2+}$$
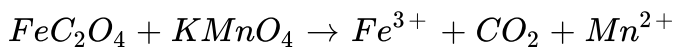
A. 0.12litre

B. 0.028 litre

C. 0.56 litre

D. 1.12 litre

Answer: C

15. A sample of 1.0g of solid $Fe_2O_3 of 80\%$ purity is dissolved in a moderately concentrated HCl solution which is reduced by zinc dust. The resulting solution required 16.7mL of a 0.1M solution of the oxidant. Calculate the number of electrons taken up by the oxidant.

A. 2

B. 4

C. 6

D. 5

Answer: C

▶ Watch Video Solution

---

16. $KMnO_4$ reacts with oxalic acid according to the equation

$2MnO_4 + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$ Here, $20mL$

of $0.1MKHMnO_4$ is equivalent to :

A. $120mL of 0.25MH_2C_2O_4$

B. $150mL of 0.10MH_2C_2O_4$

C. $25mL of 0.20MH_2C_2O_4$

D. $50mL of 0.20MH_2C_2O_4$

Answer: C

---

17. Ratio of moles of Fe (II) oxidised by equal volumes of equimolar $KMnO_4$ and $K_2Cr_2O_7$ solutions in aidic medium will be :

A. $5:3$

B. $1:1$

C. $1:2$

D. $5:6$

Answer: D

---

18. The mass of a mixture containing HCI and H_2SO_4 is $0.1g$ On treatment with an excess of an $AgNO_3$ solution , reacted with this acid

mixture given 0.1435g of $AgCI$. Mass % of the H_2SO_4 mixture is :

A. 36.5

B. 63.5

C. 50

D. none of these

Answer: B

▶ Watch Video Solution

19. A solution of $Na_2S_2O_3$ is standardized iodometrically against $0.167g$ of $KBrO_3$. This process requires $50mL$ of the $Na_2S_2O_3$ solution. What is the normality of the $Na_2S_2O_3$. ?

A. 0.2N

B. 0.12N

C. 0.72N

D. 0.02N

Answer: B

> ▶ Watch Video Solution

---

20. $0.80g$ is impure $(NH_4)SO_4)$ was boiled with $100mL$ of $0.2NNaOH$ solution till all the $NH_3(g)$ evolved. The remaining solution was diluted to $250mL$. $25mL$ of this solution was neutralized using $5mL$ of $0.2NH_2SO_4$ solution. The percentage purity of the $(NH_4)_2SO_4$ sample is :

A. 82.5

B. 72.5

C. 62.5

D. 17.5

Answer: A

> ▶ Watch Video Solution

21. The NH_3 evolved due to complete conversion of N from $1.12g$ sample of protien was absorbed in $45mL$ of $0.4NHNO_3$. The excess acid required $20mL$ of $0.1NaOH$. The % N in the sample is :

A. 8

B. 16

C. 20

D. 25

Answer: A::C

▶ Watch Video Solution

22. Find out % of oxalate ion in a given sample of an alkali metal oxalate salt, $0.30g$ of it is dissolved in $100mL$ water and its required $90mL$ of centimolar $KMnO_4$ solution in acidic medium :

A. 0.66

B. 0.55

C. 0.44

D. 0.066

Answer: A

▶ **Watch Video Solution**

---

23. $320mg$ of sample of magnesium having a coating of its oxide required $20mL$ of $0.1M$ hydrochloric acid for the complete neutralisation of the latter. The composition of the sample is :

A. 87% Mg and 12.5%MgO

B. 12.5% Mg and 87.5 %MgO

C. 80% Mg and 20%MgO

D. 20% Mg and 80%MgO

Answer: C

---

24. The concentration of bivalent lead ions in sample of polluted water that also contains nitrate ions is determined by adding solid sodium sulphate $(m = 142)$ to exacty $500mL$ water 500mL $water. Calcatethemolarityofkeadion$ if 0.355g` of solium sulphate was needed for complete precipitation of lead ions as sulphate.

---

25. What volume of HNO_3 (sq.gravity $1.05gmL^{-1}$ containing $12.6\left(\dfrac{w}{W}\right)$ of HNO_3) that reduce into NO is required to oxidise iron $gFeSO_4. 7H_2O$ in acid medium is :

A. 70mL

B. 0.57mL

C. 80mL

D. 0.65mL

Answer: C

▶ Watch Video Solution

26. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requires x mole of $KMnO_4$ in acidic medium for complete oxidation. x is :

A. 1.096mL

B. 1.32mL

C. 5.48mL

D. none of these

Answer: A

▶ Watch Video Solution

27. When $2.5g$ of a sample of mohr's salt reacts completely with $50mL$ of $\frac{N}{10}KMnO_4$ solution. The % purity of the sample of Mohr's salt is :

A. 78.4

B. 70

C. 37

D. 40

Answer: A

▶ Watch Video Solution

28. 4 mole of a mixture of Mohr's salt and $Fe_2(SO_4)_3$ requires $500mL$ of $1MK_2Cr_2O_7$ for complete oxidation in acidic medium. The mole % of the Mohr's salt in the mixture is :

A. 25

B. 50

C. 60

D. 75

Answer: D

▶ Watch Video Solution

29. The equivalent mass of a metal is twice to that of oxygen. How many times is the equivalent mass of it's oxide than the equivalent mass of the metal ?

A. $1:5$

B. 2

C. 3

D. 4

Answer: A

▶ Watch Video Solution

30. A metal oxide has the formula X_2O_3. It can be reduced by hydrogen to give free metal and water. $0.1596g$ of metal oxide requires $6mg$ of hydrogen for complete reduction. The atomic mass of the metal (in amu) is :

A. 15.58

B. 155.8

C. 5.58

D. 55.8

Answer: D

▶ Watch Video Solution

Level 1 (Q.181 To Q.200)

1. Calculate the mass of anhydrous oxalic acid, which can be oxidised to $CO_2(g)$ by $100mL$ of an MnO_4^- solution, $10mL$ of which is capable of oxiding $50mL$ of $1NI^-$ to I_2.

    A. 45g

    B. 22.5g

    C. 30g

    D. 12.25g

Answer: B

▶ **Watch Video Solution**

2. An element have atomic number 12. write its electronic configuration, period & group to which it belongs.

▶ **Watch Video Solution**

3. Stannous sulphate $(SnSO_4)$ and potassium permanganate are used as oxidising agents in acidic medium for oxidation of ferrous ammonium sulphate to ferric sulphate. The ratio of number of moles of stannous sulphate required per mole of ferrous ammounium sulphate to the number of moles of $KMnO_4$ required per mole of ferrous ammonium sulphate, is :

A. 2.5

B. 0.2

C. 0.4

D. 2

Answer: A

▶ **Watch Video Solution**

4. If a g is the mass of $NaHC_2O_4$ required to neutralize 100mL of 0.2M NaOH and b g that required to reduce 100mL of 0.02M $KMnO_4$ in acidic

medium then:

A. a=b

B. 2a=b

C. a=2b

D. none of these

Answer: D

▶ **Watch Video Solution**

---

5. 2 mole, equimolar mixture of $Na_2C_2O_4$ and $H_2C_2O_4$ required V_1L of $0.1MKHMO_4$ in acidic medium for complete oxidation. The same amount of the mixture required V_2L of $0.2MNaOH$ for neutralization. The ratio of $V_1 \to V_2$ is :

A. 1:2

B. 2:1

C. 4:5

D. 5 : 4

Answer: C

6. A mixture containing 0.05 mole of $K_2Cr_2O_7$ and 0.02 mole of $KMnO_4$ was treated with excess of KI in acidic madium. The librated iodine required 1.0L of NaS_2O_3 solution for titration. Concentration of $Na_2S_2O_3$ solution was :

A. $0.4mol L^{-1}$

B. $0.20mol L^{-1}$

C. $0.25mol L^{-1}$

D. $0.30mol L^{-1}$

Answer: A

7. $25mL$ of $2NHCI$, $50mL$ of $4NHNO_3$ and xmL of $2MH_2SO_4$ are mixed together and the total volume is made up to $1L$ after dilution. $50mL$ of this acid mixture completely reacted with $25mL$ of a $1Na_2CO_3$ solution. The value of x is :

A. 250mL

B. 62.5mL

C. 100mL

D. none of these

Answer: B

▶ **Watch Video Solution**

---

8. In an iodometric estimation, the following reactions occur

$2Cu^{2+} + 4I^- \rightarrow CU_2I_2 + i_2$, $I_2 + 2Na_2S_2O_3 \rightarrow 2NaI + Na_2S_4O_6$ 0.12 mole of $CuSO_4$ aws added to excess of KI solution and the liberated iodine required $120mL$ of hypo. The molarity of hypo solution was :

A. 2

B. 0.2

C. 0.1

D. 1

Answer: D

▶ Watch Video Solution

---

9. $1g$ mixture of equal number of mole of Li_2Co_3 and other metal carbonate (M_2CO_3) required $21.6mL$ of $0.5NHCI$ for complete neutralisation reaction. What is the approximate atomic mass of the other metal ?

A. 25

B. 23

C. 51

D. 118

Answer: D

10. 32g of a sample of $FeSO_4 . 7H_2O$ were dissolvedin dilute sulphuric acid and water and its volume was made up to 1 litre. $25mL$ of this solution required $20mL$ of $0.02MKMnO_4$ solution for complete oxidation. Calculate the mass % of $FeSO_4 . 7H_2O$ in the sample.

A. 34.75

B. 69.5

C. 89.5

D. none of these

Answer: A

11. A mixture $NaOH + Na_2CO_3$ required 25mL of 0.1 M HCl using using phenolpththalein indicator. However the same amount of the mixture required 30mL of 0.1M HCl when methyl orange was used as the indicator. The molar ration of $NaOH$ and Na_2CO_3 in the mixture was:

A. 2x

B. y

C. x/2

D. (y-x)

Answer: D

▶ Watch Video Solution

12. $0.1g$ of a solution containing Na_2CO_3 and $NaHCO_3$ requires $10mL$ of $0.01NHCI$ for neutralization using phenolphthalein as an indicator. mass % of Na_2CO_3 in solution is :

A. 25

B. 32

C. 50

D. none of these

Answer: C

▶ Watch Video Solution

13. A mixture $NaOH + Na_2CO_3$ required 25mL of 0.1 M HCl using using phenolpththalein indicator. However the same amount of the mixture required 30mL of 0.1M HCl when methyl orange was used as the indicator. The molar ration of $NaOH$ and Na_2CO_3 in the mixture was:

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer: A

---

14. When 100mL solution of $NaOH$ and $NaCO_3$ was first titrated with N/10 HCl in presence of HPh, 17.5mL were usedtill end point is obtained. After this end point MeOH was added and 2.5mL of same HCl were required to attain new end point. The amount NaOH in mixture is:

    A. 0.06g per 100mL

    B. 0.06g per 200mL

    C. 0.05 g per 100mL

    D. 0.012 g per 200mL

Answer: A

15. A sample of pure sodium carbonate 0.318g is dissolved in water and titrated with HCl solution. A volume of 60mL is required to reach the methyl orange end point. Calculate the molarity of the acid.

A. 0.1M

B. 0.2M

C. 0.4M

D. none of these

Answer: A

▶ **Watch Video Solution**

16. $10L$ of hard water required $5.6g$ of lime for removing haardness. Hence temporary hardness in ppm of $CaCO_3$ is :

A. 1000

B. 2000

C. 100

D. 1

Answer: A

> ▶ Watch Video Solution

17. $1L$ of pond water contains $20mg$ of Ca^{2+} and $12mg$ of mg^{2+} ions. What is the volume of a $2NNa_2CO_3$ solution required to soften $5000L$ of pond water ?

A. 500L

B. 50L

C. 5L

D. none of these

Answer: C

> ▶ Watch Video Solution

18. One litre of a sample of hard water contain $4.44 mgCaCl_2$ and $1.9 mgofMgCl_2$. What is the total hardness in terms of ppm of $CaCO_3$?

A. 2ppm

B. 3ppm

C. 4ppm

D. 6ppm

Answer: D

▶ Watch Video Solution

---

19. select incorrect statement :

A. Mass ratio of$CaCO_3$to$H_2O$is$\dfrac{0.02}{100}$

B. Mole ratio of$CaCO_3$toH_2Ois3.6×10^{-5}

C. Mass of $CaCO_3$ present in hard water is $0.2g/L$

D. 1 miliequivalent of $CaCO_3$ present in 1kg of hard water

Answer: D

▶ Watch Video Solution

1. A mixture of NH_4NO_3 and $(NH_4)_2HPO_4$ contain 30.40% mass per centof nitrogen. What is the mass ratio of the two components in the mixture ?

A. $2:1$

B. $1:2$

C. $3:4$

D. $4:1$

Answer: A

---

2. What volume of 75 % acohol by weight $\left(d = 0.80\frac{g}{c}m^3\right)$ must be used to prepare $150cm^3$ of 30 % alcohol by mass $\left(d = 0.90\frac{g}{c}m^2\right)$?

A. 67.5 mL

B. 56.25 mL

C. 44.44 mL

D. None of these

Answer: A

---

3. Calculate the number of millilitre of $NH_3(aq)$ solution $\left(d = 0.986\frac{g}{m}L\right)$ contain 2.5 % by mass NH_3, which will be required to

precipitate iron as $Fe(OH)_3$ in a 0.8g sample that contains 50 % Fe_2O_3.

A. 0.344 mL

B. 3.44 mL

C. 17.24 mL

D. 10.34 mL

Answer: D

▶ **Watch Video Solution**

---

4. In the preparation of iron from haematite (Fe_2O_3) by the reduction

with carbon $Fe_2O_3 + C \rightarrow Fe + CO_2$ how much 80 % pure iron may

be produced from 120kg of 90 % pure Fe_2O_3 ?

A. 94.5 kg

B. 60.48 kg

C. 116.66 kg

D. 120 kg

Answer: A

> ▶ **Watch Video Solution**

---

5. A mineral consists of an equimolar mixture of the carbonates of two bivalent metals. One metal is present to the extent of 12.5% by mass $2.8g$ of the mineral on heating lost $1.32g$ of CO_2. What is the % by mass of the other metal ?

A. 87.5

B. 35.71

C. 65.11

D. 23.21

Answer: D

> ▶ **Watch Video Solution**

6. $6.2g$ of a sample containing Na_2CO_3, $NaHCO_3$ and non-volatile inert impurity on gentle heating loses 5% of its mass due to reaction $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$. Residue is dissolved in water and formed $100mL$ solution and its $10mL$ portion requires $7.5mL$ of $0.2M$ aqueous solution of $BaCI_2$ for complete precipitation of carbonates. Determine mass (in gram) of Na_2CO_3 in the original sample.

A. 1.59

B. 1.06

C. 0.53

D. None of these

Answer: B

7. Nitric acid can be produced from NH_3 in three steps process below
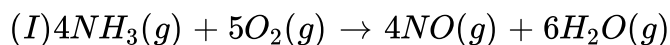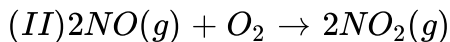
$(I)4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$

$(II) 2NO(g) + O_2 \rightarrow 2NO_2(g)$

$(III) 3NO_2(g) + H_2O(l) \rightarrow 2HNO_3(aq) + NO(g)$ percent yield of

1st, 2nd and 3rd step are respectively 50 % , 60 % and 80 % respectively

then what volume of $NH_3(g)$ at 1 atm and $0°C$ required to produced

1575g of HNO_3.

A. 156.25

B. 350 L

C. 3500 L

D. None of these

Answer: C

▶ **Watch Video Solution**

---

8. 1 M NaOH solution was slowly added in to 1000 mL of 183.75 g impure

H_2SO_4 solution and the following plot was obtained. The percentage

purity of H_2SO_4 sample and slope of the curve respectively are:

A. 75%, $-\dfrac{1}{3}$

B. 80%, $-\dfrac{1}{2}$

C. 80%, -1

D. None of these

Answer: C

▶ **Watch Video Solution**
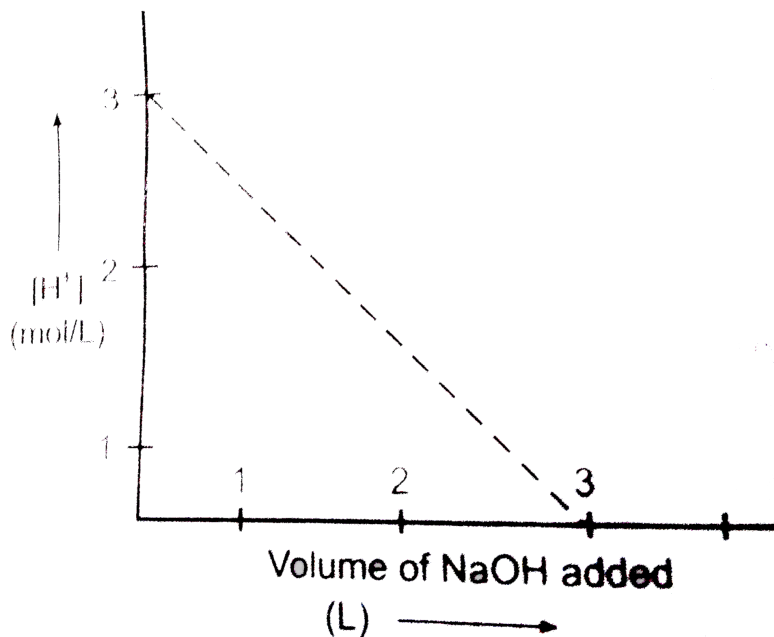
9. MnO_2 on ignition converts into Mn_3O_4. A sample of pyrolusite having 75% MnO_2, 20% inert impurities and rest water is ignited in air to constant mass. What is the percentage of Mn in the ignited sample ?

A. 0.246

B. 37

C. 55.24

D. 0.7405

Answer: C

▶ **Watch Video Solution**

10. A 1.0g sample of a pure organic compound cotaining chlorine is fused with Na_2O_2 to convert chlorine to NaCl. The sample is then dissolved in water, and the chloride precipitated with $AgNO_3$, giving 1.96 g of AgCl. If the molecular mass of organic compound is 147, how many chlorine does each molecule contain ?

A. 1

B. 2

C. 3

D. 4

Answer: B

▶ Watch Video Solution

---

11. A 0.6gm sample consisting of only CaC_2O_4 and MgC_2O_4 is heated at $500°C$gets converted into $CaCO_3$ and $MgCO_3$. The sample then weighed 0.465gm. If the sample had been heated to $900°C$ where the products are CaO and MgO, then what would the mixture of oxides weigh?

A. 0.12 g

B. 0.21 g

C. 0.252 g

D. 0.3 g

12. A metal M forms the sulphate $M_2(SO_4)_3$. A0.596 gram sample of the sulphate reacts with excess $BaCI_2$ to given $1.220gBaSO_4$. What is the atomic mass of M? (Atomic mass : $S = 32, Ba = 137.3$)

A. 26.9

B. 69.7

C. 55.8

D. 23

13. At identical temperature and pressure the rate of diffusion of hydrogen gas is $3\sqrt{3}$ times that of a hydrocarbon having molecular formula C_nH_{2n-2} What is the value of n ? .

A. a. $C_{10}H_{22}$

B. b .$C_{12}H_{26}$

C. c $C_{13}H_{28}$

D. d C_8H_{18}
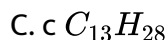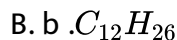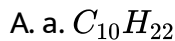
Answer: B

▶ Watch Video Solution

14. $11.6g$ of an organic compound having formula C_nH_{2n+2} is burnt in excess of $O_2(g)$ initially taken in a 22.41 litre steel vessel. Before reactioOn the gaseous mixture was at $273K$ with pressure reading 2 atm. Aftercomplete combustion and loss of considerable amount of heat, the mixture of product and excess of O_2 had a temperature of $546K$ and 4.6 atm pressure. The formula of organic compound is :

A. C_6H_6

B. C_3H_8

C. C_5H_{12}

D. C_4h_{14}
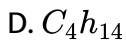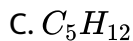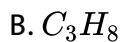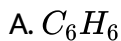
Answer: D

▶ Watch Video Solution

15. How many neutrons, protons & electrons are in oxygen (mass 17)

▶ Watch Video Solution

16. SO_2CI_2 (sulphury chloride) reacts with water to given a mixture of H_2SO_4 and HCI. What volume of $0.2MBa(OH)_2$ in needed to completely neutralize $25mL$ of $0.2MSO_2CI_2$ solution :

A. 25 mL

B. 50 mL

C. 100 mL

D. 200 mL

Answer: B

▶ **Watch Video Solution**

---

17. 5 g sample contain only Na_2CO_3 and Na_2SO_4 . This sample is dissolved and the volume made up to 250 mL. 25 mL of this solution neutralizes 20 mL of 0.1 M H_2SO_4.

Calcalute the % of Na_2SO_4 in the sample .

A. 42.4

B. 57.6

C. 36.2

D. None of these

Answer: B

18. 20 mL of 0.2 M NaOH(aq) solution is mixed with 35 mL of this 0.1 ML NaOH (aq) solution and the resultant solution is diluted to 100 mL. 40 mL of this diluted solution reacted with 10% impure sample of oxalic acid $(H_2C_2O_4)$ The mass of impure is:

    A. 0.15 gram

    B. 0.135 gram

    C. 0.59 gram

    D. None of these

Answer: A

19. A silver coin weighing 11.34 g was dissolved in nitric acid When sodium chloride was added to the solution all the silver (present as $AgNO_3$) precipitated as silver chloride. The mass of the precipitated silver chloride was 14.35 g. Calculate the percentage of silver in the coin.

A. 48 %

B. 95.2 %

C. 90%

D. 80%

Answer: B

▶ Watch Video Solution

20. Two elements X (at.mass 16) and Y (at.mass 14) combine to form compounds A, B and C. The ratio be different masses of Y which combine with a fixed mass of X in A, B and C is $1:3:5$. If 32 parts by

mass of X combines with 84 parts by mass of Y in B then in C, 16 parts by mass of X will combine with :

A. 14 parts by mass of Y

B. 42 parts by mass of Y

C. 70 parts by mass of Y

D. 84 parts by mass of Y

Answer: C

▶ Watch Video Solution

21. The conversion of oxygen to ozone occurs to the extent of 15% only. Find mass of ozone that can be prepared from $67.2L$ of oxygen at 1 atm and $273K$ will be :

A. 14.4 g

B. 96 g

C. 640 g

D. 64 g

22. RH_2 (ion exchange resin) can replace Ca^{2+} ions in hard water as $RH_2 + Ca^{2+} \rightarrow RCa + 2H^+$. If 1 L of hard water after passing through RH_2 has $pH = 3$ then hardness in parts per million of Ca^{2+} is :

A. 20

B. 10

C. 40

D. 100

23. $100cm^3$ of a solution of an acid (Molar mass $= 98$) containing $29.4g$ of the acid per litre were completely neutralized by $90.0cm^3$ of aq. $NaOH$ containing $20g$ of $NaOH$ per $500cm^3$. The basicity of the acid is :

A. 3

B. 2

C. 1

D. data insufficient

Answer: A

▶ Watch Video Solution

---

24. $20mL$ of $0.1M$ solution of compound $Na_2CO_3 . 2H_2O$ is titrated against $0.05MHCI$. xmL of HCI is used when phenolphthalein is used as an indicator and y mL of HCI is used when methly orange is the indicator in two separate titrations. Hence $(y - x)$ is :

A. 40 mL

B. 80 mL

C. 120 mL

D. None of these

Answer: B

---

25. A sample containing $HAsO_2$ (mol. mass $= 180$) and weighing $3.78g$ is dissolved and diluted to $250mL$ in a volumetric flask. $A\,50mL$ sample (aliquat) is withdrawn with a pipet and titrated with $35mL$ of $0.05M$ solution of I_2. Calculate the percentage $HAsO_2$ in the sample :

A. 0.25

B. 0.2

C. 0.1

D. None of these

Answer: A

26. A mixture of FeO and Fe_2O_3 is completely reacted with $100 mL$ of $0.25M$ acidified $KMnO_4$ solution. The resulting solution was then treated with Zn dust which converted Fe^{3+} of the solution to fe^{2+}. The $Fe^{2=}$ required $100 mL$ of $0.10 MK_2Cr_2O_7$ solution. Find out the weight % Fe_2O_3 in the mixture.

A. 80.85

B. 19.15

C. 50

D. 89.41

Answer: A

27. To a 10mL, 1M aqueous solution of Br_2, excess of NaOH is added so that all Br_2 is disproportionated to Br^- and BrO_3^-. The resulting solution is free from Br^-, by extraction and excess of OH^- neutralised by acidifying the solution. The resulting solution is suffcient to react with 2 g of impure CaC_2O_4(M= 128g/mol) sample. The % purity of oxalate sample is :

A. 85.3 %

B. 12.5 %

C. 90 %

D. 64 %

Answer: B

▶ Watch Video Solution

28. A mixture of H_2SO_4 and $H_2C_2O_4$ (oxalic acid) and some inert impurity weighing 3.185 g was dessolved in water and the solution made

up to 1litre. 10 mL of this solution required 3 mL of 0.1 N NaOH for complete neutralization. In another experiment 100 mL of the same solution in hot condition required 4 mL of 0.02 M $KMnO_4$ solution for complete reaction. The mass % of H_2SO_4 in the mixture was:

A. 7.41

B. 74.1

C. 61.75

D. None of these

Answer: B

▶ **Watch Video Solution**

---

29. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requires x mole of $KMnO_4$ in acidic medium for complete oxidation. x is :

A. 0.5 mole

B. 0.9 mole

C. 1.2 mole

D. 4.5 mole

Answer: B

▶ **Watch Video Solution**

30. An impure sample of sodium oxalate $(Na_2C_2O_4)$ weighing $0.20g$ is dissolved in aqueous solution of H_2SO_4 and solution is titrated at 70 C requiring $45mL$ of $0.02MKMnO_4$ solution. The end point is overrun, and back titration in carried out with $10mL$ of $0.1M$ oxalic acid solution. Find the % purity of $Na_2C_2O_4$ in sample :

A. 75

B. 83.75

C. 90.25

D. None of these

Answer: B

Level 2 (Q.31 To Q.35)

1. 0.5 g mixture of $K_2Cr_2O_7$ and $KMnO_4$ was treated with excess of KI in acidic medium. Iodine liberated required $150cm^3$ of 0.10 N solution of thiosulphate solution for titration.

Find the percentage of $K_2Cr_2O_7$ in the mixture :

A. 14.64

B. 34.2

C. 65.69

D. 50

Answer: A

2. A $150mL$ of solution of I_2 is divided into two unequal parts. I part with hypo solution in acidic medium. 15mL of $0.4M$ hypo was consumed. II part was added with 100mL of $0.3MNaOH$ solution. Residual base required 10 mL of $0.3MH_2SO_4$ solution for complete neutralization. What was the initial concentration of I_2?

A. 0.08 M

B. 0.1 M

C. 0.2 M

D. None of these

Answer: B

▶ Watch Video Solution

3. A mixture of H_2SO_4 and $H_2C_2O_4$ (oxalic acid) and some inert impurity weighing 3.185 g was dessolved in water and the solution made up to 1litre. 10 mL of this solution required 3 mL of 0.1 N NaOH for complete

neutralization. In another experiment 100 mL of the same solution in hot condition required 4 mL of 0.02 M $KMnO_4$ solution for complete reaction. The mass % of H_2SO_4 in the mixture was:

A. 40

B. 50

C. 60

D. 80

Answer: A

▶ Watch Video Solution

4. Calculate the mass of 9.87 mole of limestone?

▶ Watch Video Solution

5. The concentration of an oxalic acid solution is x $mol\ litre^{-1}$. $40mL$ of this solution reacts with $16mL$ of $0.05M$ acidified $KMnO_4$. What is the pH of 'x' M oxalic acid solution ? (Assume that oxalic acid dissociates completely).)

A. 1.3

B. 1.699

C. 1

D. 2

Answer: C

▶ **Watch Video Solution**

Level 3 - Passage

1. Oleum is considered as a solution of SO_3 in H_2SO_4, which is obtained by passing SO_3 in solution of H_2SO_4 When 100 g sample of oleum is

diluted with desired mass of H_2O then the total mass of H_2SO_4 obtained after dilution is known is known as % labelling in oleum.

For example, a oleum bottle labelled as '019 % H_2SO_4' means the 109 g total mass of pure H_2SO_4 will be formed when 100 g of oleum is diluted by 9 g of H_2O which combines with all the free SO_3 present in oleum to form H_2SO_4 as $SO_3 + H_2O \rightarrow H_2SO_4$

1 g of oleum sample is diluted with water. The solution required 54 mL of 0.4 N NaOH for complete neutralization. The % free SO_3 in the sample is :

A. 10

B. 20

C. 40

D. None of these

Answer: B

> ▶ Watch Video Solution

---

2. Calculate the mass of 2.5 mole of naphthalene

3. Oleum is considered as a solution of SO_3 in H_2SO_4, which is obtained by passing SO_3 in solution of H_2SO_4 When 100 g sample of oleum is diluted with desired mass of H_2O then the total mass of H_2SO_4 obtained after dilution is known is known as % labelling in oleum.

For example, a oleum bottle labelled as '019 % H_2SO_4' means the 109 g total mass of pure H_2SO_4 will be formed when 100 g of oleum is diluted by 9 g of H_2O which combines with all the free SO_3 present in oleum to form H_2SO_4 as $SO_3 + H_2O \rightarrow H_2SO_4$

If excess water is added into a bottle sample labelled as "112%H_2SO_4" and is reacted with 5.3 g $NaCO_3$ then find the volume of CO_2 evolved at 1 atm pressure and 300 K temperature after the completion of the reaction :

A. 2.46 L

B. 24.6 L

C. 1.23 L

D. 12.3 L

Answer: C

▶ Watch Video Solution

---

4. Oleum is considered as a solution of SO_3 in H_2SO_4, which is obtained

by passing SO_3 in solution of H_2SO_4 When 100 g sample of oleum is

diluted with desired mass of H_2O then the total mass of H_2SO_4

obtained after dilution is known is known as % labelling in oleum.

For example, a oleum bottle labelled as '019 % H_2SO_4' means the 109 g

total mass of pure H_2SO_4 will be formed when 100 g of oleum is diluted

by 9 g of H_2O which combines with all the free SO_3 present in oleum to

form H_2SO_4 as $SO_3 + H_2O \rightarrow H_2SO_4$

1 g of oleum sample is diluted with water. The solution required 54 mL of

0.4 N NaOH for complete neutralization. The % free SO_3 in the sample is :
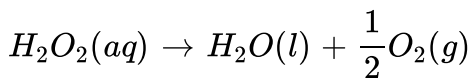
A. 74

B. 26

C. 20

D. None of these

Answer: B

> ▶ Watch Video Solution

---

5. The strength of H_2O_2 is expressed in several ways like molarity, normality,% (w/V), volume strength, etc. The strength of "10 V" means 1 volume of H_2O_2 on decomposition gives 10 volumes of oxygen at 1 atm and 273 K or 1 litre of H_2O_2gives 10 litre of O_2 at 1 atm and 273 K The decomposition of H_2O_2 is shown as under :

$$H_2O_2(aq) \rightarrow H_2O(l) + \frac{1}{2}O_2(g)$$

H_2O_2 can acts as oxidising as well as reducing agent. As oxidizing agent H_2O_2 is converted into H_2O and as reducing agent H_2O_2 is converted into O_2. For both cases its n-factor is 2. $\therefore$ Normality ofH_2O_2 " solution

" $= 2 \times$ molarity ofH_2O_2 solution

What is the molarity of "11.2 V" H_2O_2 ?

A. 1 M

B. 2 M

C. 5.6 M

D. 11.2 M

Answer: A

6. The strength of H_2O_2 is expressed in several ways like molarity, normality,% (w/V), volume strength, etc. The strength of "10 V" means 1 volume of H_2O_2 on decomposition gives 10 volumes of oxygen at 1 atm and 273 K or 1 litre of H_2O_2gives 10 litre of O_2 at 1 atm and 273 K The decomposition of H_2O_2 is shown as under :

$$H_2O_2(aq) \rightarrow H_2O(l) + \frac{1}{2}O_2(g)$$
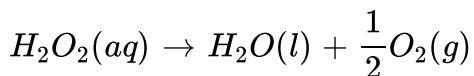
H_2O_2 can acts as oxidising as well as reducing agent.

What is the percentage strength (%w/V) of "11.2 V" H_2O_2

A. 1.7

B. 3.4

C. 34

D. None of these

Answer: B

▶ Watch Video Solution

---

7. 20mL of H_2O_2 solution is reacted with 80 mL of $0.05MKMnO_4$ "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

Answer: B

▶ Watch Video Solution

8. 40 g $Ba(MnO_4)_2$ (mol.mass=375) sample containing some inert impurities in acidic medium completely reacts with 125 mL of "33.6 V" of H_2O_2. What is the percentage purity of the sample ?

A. 28.12

B. 70.31

C. 85

D. None of these

Answer: B

▶ **Watch Video Solution**

9. What is the mass of 1 mole of calcium hydroxide.

▶ **Watch Video Solution**

10. "Equivalent mass" =("Molecular mass/Atomic mass")/("n-factor")

n-factor is very important in redox as well as non-redox reactions. With the help of n-factor we can predict the molar ratio of the reactant species taking part in reactions. The reciprocal of n-factor's ratio of the reactions is the molar ratio of the reactants.

In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base n-factor of a reactant is number of moles electrons lost or gained per mole of reactant.

Example 1:

(1)In acidic medium : $KMnO_4(n = 5) \rightarrow Mn^{2+}$

(2) In neutral medium : $KMnO_4(n = 3) \rightarrow Mn^{2+}$

(3) In basic medium : $KMnO_4(n = 1) \rightarrow Mn^{6+}$

Example 2 : $FeC_2O_4 \rightarrow Fe^{3+} + 2CO_2$

Total number of moles e^- lost by 1 mole of FeC_2O_4

$= 1 + 1 \times 2 \Rightarrow 3$

n-factor of $Ba(MNO_4)_2$ in acidic medium is :
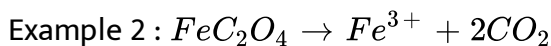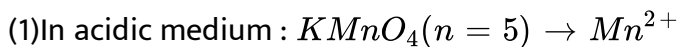
A. 2

B. 6

C. 10

D. None of these

Answer: C

▶ Watch Video Solution

11. "Equivalent mass" =("Molecular mass/Atomic mass")/("n-factor")

n-factor is very important in redox as well as non-redox reactions.With the help of n-factor we can predict the molar ratio of the reactant species specis taking part in reactions. The reciprocal of n-factor's ratio of the reactions is the molar ratio of the reactants.

In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base n-factor of a reactant is number of moles electrons lost or gained per mole of reactant.

Example 1:

(1)In acidic medium : $KMnO_4(n = 5) \rightarrow Mn^{2+}$

(2) In neutral medium : $KMnO_4(n = 3) \rightarrow Mn^{2+}$

(3) In basic medium : $KMnO_4(n = 1) \rightarrow Mn^{6+}$

Example 2 : $FeC_2O_4 \rightarrow Fe^{3+} + 2CO_2$

Total number of moles e^- lost by 1 mole of FeC_2O_4

$$= 1 + 1 \times 2 \Rightarrow 3$$

Consider the following reaction.

$$H_3PO_2 + NaOH \rightarrow NaH_2PO_2 + H_2O$$
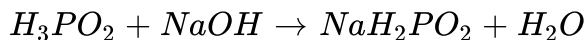
What is the equivalent mass of H_3PO_2 ?(mol.Wt.is M)

A. M

B. `M/2

C. M/3

D. None of these

Answer: A

▶ Watch Video Solution

12. "Equivalent mass" =("Molecular mass/Atomic mass")/("n-factor")

n-factor is very important in redox as well as non-redox reactions.With

the help of n-factor we can predict the molar ratio of the reactant species

specis taking part in reactions. The reciprocal of n-factor's ratio of the reactions is the molar ratio of the reactants.
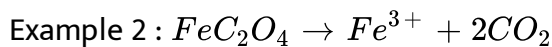
In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base n-factor of a reactant is number of moles electrons lost or gained per mole of reactant.

Example 1:

(1)In acidic medium : $KMnO_4(n = 5) \to Mn^{2+}$

(2) In neutral medium : $KMnO_4(n = 3) \to Mn^{2+}$

(3) In basic medium : $KMnO_4(n = 1) \to Mn^{6+}$

Example 2 : $FeC_2O_4 \to Fe^{3+} + 2CO_2$

Total number of moles e^- lost by 1 mole of FeC_2O_4

$$= 1 + 1 \times 2 \Rightarrow 3$$

For the reaction, $Fe_{0.95}O(\text{molar mass=M}) \to Fe_2O_3$ what is the eq. mass of $fe_{0.95}O$?

A. $\dfrac{M}{0.85}$

B. $\dfrac{M}{0.95}$

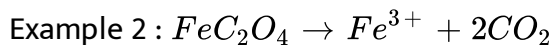C. $\dfrac{M}{0.8075}$

D. None of these

Answer: A

13. "Equivalent mass" =("Molecular mass/Atomic mass")/("n-factor")

n-factor is very important in redox as well as non-redox reactions.With the help of n-factor we can predict the molar ratio of the reactant species specis taking part in reactions. The reciprocal of n-factor's ratio of the reactions is the molar ratio of the reactants.

In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base n-factor of a reactant is number of moles electrons lost or gained per mole of reactant.

Example 1:

(1)In acidic medium : $KMnO_4(n = 5) \rightarrow Mn^{2+}$

(2) In neutral medium : $KMnO_4(n = 3) \rightarrow Mn^{2+}$

(3) In basic medium : $KMnO_4(n = 1) \rightarrow Mn^{6+}$

Example 2 : $FeC_2O_4 \rightarrow Fe^{3+} + 2CO_2$

Total number of moles e^- lost by 1 mole of FeC_2O_4

$= 1 + 1 \times 2 \Rightarrow 3$

In the reaction, $xVO + yFe_2O_3 \rightarrow FeO + V_2O_5$ what is the value of x and y respectively?

A. 1,1

B. 2,3

C. 3,2

D. None of these

Answer: B

▶ Watch Video Solution

---

14. Consider the following series of reactions :

$Cl_2 + 2NaOH \rightarrow NaCl + NaClO + H_2O$

$3NaClO \rightarrow 2NaCl + NaClO_3$

$4NaClO_3 \rightarrow 3NaClO_4 + NaCl$
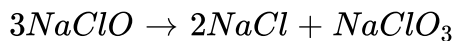
How much Cl_2 is reqired to prepare 122.5 g of $NaClO_4$ by above sequencial reactions ?

A. 284 g

B. 213 g

C. 142 g

D. 71 g

Answer: A

▶ **Watch Video Solution**

---

15. Consider the following series of reactions :

$$Cl_2 + 2NaOH \rightarrow NaCl + NaClO + H_2O$$

$$3NaClO \rightarrow 2NaCl + NaClO_3$$

$$4NaClO_3 \rightarrow 3NaClO_4 + NaCl$$
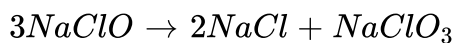
How many moles of NaCl will be formed by using 1 mole Cl_2 and other

reagents in excess ?

A. $\dfrac{1}{12}$ mole

B. 1.67 mole

C. 1.75 mole

D. 0.75 mole

Answer: C

▶ Watch Video Solution

---

16. Consider the following series of reactions :

$$Cl_2 + 2NaOH \rightarrow NaCl + NaClO + H_2O$$

$$3NaClO \rightarrow 2NaCl + NaClO_3$$

$$4NaClO_3 \rightarrow 3NaClO_4 + NaCl$$

many moles $NaClO_3$ obtained after the complection of reaction by taking 1 mole Cl_2 and other reagents in excess ?

A. $\dfrac{1}{3}$ mole

B. Zero

C. $\dfrac{1}{4}$ mole

D. 1 mole

Answer: B

Level 3 - One Or More Answers Are Correct

1. 1 g of nitrogen represents :

A. $6.02 \times 10^{23} N_2$ molecules

B. 22.4 litre of N_2 at 1 atm and 273 K

C. 11.2 litre of N_2 at 1 atm and 273 K

D. 14 g of nitrogen

Answer: C::D

2. 1 g molecule of V_2O_5 contains :

A. 5 mole of oxygen atom

B. 2 mole of V atom

C. 1 mole of oxygen atom

D. 2.5 mole of oxygen atom

Answer: A::B

▶ **Watch Video Solution**

3. Select the dimensionless quantity (ies) :

A. vapour density

B. molality

C. specific gravity

D. mass fraction

Answer: A::C::D

▶ **Watch Video Solution**

4. Which of the following concentration terms is/are affected by a change in temperature ?

    A. Molarity

    B. Molality

    C. Normality

    D. Specific gravity

Answer: A::C::D

▶ **Watch Video Solution**

---

5. Which of the following statements regarding the compound $A_x B_y$ is /are correct?

    A. 1 mole of $A_x B_y$ contains 1 mole of A and 1 mole B

B. 1 equivalent of $A_x B_y$ contains 1 equivalent of A and 1 equivalent of

B

C. 1 mole of $A_x B_y$ contains x moles of A and y moles of B

D. equivalent mass of $A_x B_y$=equivalent mass of A +equivalent mass of

B

Answer: B::C::D

▶ **Watch Video Solution**

---

6. 1 mole of $Ba(OH)_2$ will exactly neutralize :

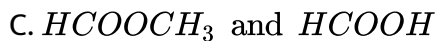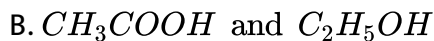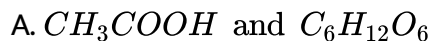A. 0.5 mole HCL

B. 1 mole of $H_2 SO_4$

C. 1 mole of $H_3 PO_3$

D. 2 mole of $H_3 PO_2$

Answer: B::C::D

7. The pair of species having different percentage (mass) of carbon is :

A. CH_3COOH and $C_6H_{12}O_6$

B. CH_3COOH and C_2H_5OH

C. $HCOOCH_3$ and $HCOOH$

D. C_2H_5OH and CH_3OCH_3

Answer: B::D

8. $30mL$ of $CH_3OH(d = 0.8g/cm^3)$ is mixed with $60mL$ of $C_2H_5OH(d = 0.92g/cm^2)$ at $25°C$ to form a solution of density $0.88g/cm^3$. Select the correct option(s) :

A. Molarity and molality of resulting solution are 6.33 and 13.59 respectively

B. The mole fraction of solute and molality are 0.385 and 13.59 respectively

C. Molarity and % change in volume are 0.615 and zero respectively

D. Mole fraction of solvent and molality are 0.615 and 13.59 respectively

Answer: B::C

▶ **Watch Video Solution**

---

9. Which of the following is/are incorrect for 17 g/L of H_2O_2 solution ?

A. Volume strengths is 5.6 at 273 K and 1 atm

B. Molarity of solution is 0.5 M

C. 1 mL of thios solution gives 2.8 mL O_2 at 273 K and 2 atm

D. The normality of solution is 2 N

Answer: A::B::C

▶ Watch Video Solution

---

10. Solutions containing 23 g HCOOH is/are :

A. $46g$ of 70% $\left(\dfrac{w}{V}\right) HCOOH (d_{\text{solution}} = 1.40g/mL)$

B. $50g$ of 10 M $HCOOH (d_{\text{solution}} = 1g/mL)$

C. $50g$ of 25% $\left(\dfrac{w}{w}\right) HCOOH$

D. 46 g " of 5 M " HCOOH$(d_{solution} = 1g/mL)$

Answer: A::B

▶ Watch Video Solution

11. A sample of H_2O_2 solution labelled as "28 volume" has density of 265 g/L. Mark the correct option(s) representing concentration of same solution in other units :

A. $M_{H_2O_2} = 2.5$

B. $\% \dfrac{w}{V} = 17$

C. Mole fraction of H_2O_2 = 0.2

D. $m_{H_2O_2} = 13.88$

Answer: A::C::D

▶ **Watch Video Solution**

---

12. $11.6g$ of an organic compound having formula C_nH_{2n+2} is burnt in excess of $O_2(g)$ initially taken in a 22.41 litre steel vessel. Before reactioOn the gaseous mixture was at $273K$ with pressure reading 2 atm. Aftercomplete combustion and loss of considerable amount of heat, the
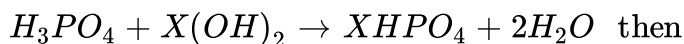
mixture of product and excess of O_2 had a temperature of $546K$ and 4.6 atm pressure. The formula of organic compound is :

A. a.30 mL,60mL,10mL

B. b.30 mL,50mL, 20mL

C. c.60 mL,30mL,20mL

D. d.20 mL,70 mL, 10 mL

Answer: A::B

▶ Watch Video Solution

---

13. If 1 mole of H_3PO_4 reacts with 1 mole of $X(OH)_2$ as shown below :

$$H_3PO_4 + X(OH)_2 \rightarrow XHPO_4 + 2H_2O \text{ then}$$

A. the equivalent mass of base is $\dfrac{mol.\ mass}{2}$

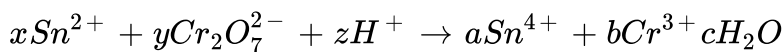B. the eq. mass of H_3PO_4 is $\dfrac{98}{3}$

C. the resulting solution requires 1 mole NaOH for complete neutralization

D. minimum 1 mole of $X(OH)_2$ is required for complete neutralization of $XHPO_4$

Answer: A::C

▶ **Watch Video Solution**

14. In acidic medium dichromate oin osxidizes stannous ion as :

$$x Sn^{2+} + yCr_2O_7^{2-} + zH^+ \rightarrow aSn^{4+} + bCr^{3+} + cH_2O$$

A. "the value of x:y is " 1:3

B. the value of x+y+z is 18

C. a:b " is " 3:2

D. the value of z-c is 7

Answer: B::C::D

15. When a equimolar mixture of Cu_2S and CuS is tirated with $Ba(MnO_4)_2$ in acidic medium, the final products cintain Cu^{2+}, So_2 and Mn^{2+}. If the mol. Mass of Cu_2S, and $Ba(MnO_4)_2$ are M_1, M_2 and M_3 respectively then :

A. eq. mass of Cu_2S is $\dfrac{M_1}{8}$

B. eq. mass of CuS is $\dfrac{M_2}{6}$

C. eq. mass of $Ba(MnO_4)_2$ is $\dfrac{M_3}{5}$

D. Cu_2 and CuS both have same equivalents in mixture

Answer: A::B

16. Which is/are INCORRECT statement ?

A. a.Equivalent mass of $H_2PO_3^-$ is 40.5.

B. b.Eq. mass of $H_2PO_4^-$ may be equal to molar mass or less than

molar mass because it depends on the reaction.

C. c.$KMnO_4$ has maximum eq. mass in acidic medium.

D. d.Oxidation state of H in MgH_2 is greater than in H_2O_2.

Answer: A::C::D

▶ **Watch Video Solution**

Level 3 - Match The Column

1. Find the atomic number, no of proton & no of neutron of element X if

mass number is 27 and no of electron is 13.

▶ **Watch Video Solution**

2. Draw the structure of BF3.

Column-I	Column-II
(A) Eq. mass = $\dfrac{Molecular\ mass}{33}$	(P) When CrI_3 oxidises into $Cr_2O_7^{2-}$ and IO_4^-
(B) Eq. mass = $\dfrac{Molecular\ mass}{27}$	(Q) When $Fe(SCN)_2$ oxidises into Fe^{3+}, SO_4^{2-}, CO_3^{2-} and NO_3
(C) Eq. mass = $\dfrac{Molecular\ mass}{28}$	(R) When NH_4SCN oxidizes into SO_4^{2-}, CO_3^{2-} and NO_3^-
(D) Eq. mass = $\dfrac{Molecular\ mass}{24}$	(S) When As_2S_3 oxidises into AsO_3^- and SO_4^{2-}

3.

4. An element have three shells & have five valance electrons. identify the element.

5. How many electrons , protons and neutrons are present in Ba2+ having atomic no 56 and atomic mass 137.
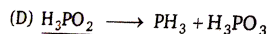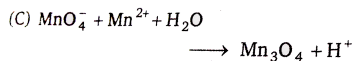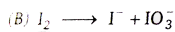
▶ Watch Video Solution

Match the Colum-II

1. An element have two shells & have one valance electrons. identify the element.

▶ Watch Video Solution

Column-II

Column-I

(A) When Bi_2S_3 converted into Bi^{5+} and S   (P)   18

(B) When $Al_2(Cr_2O_7)_3$ reduced into Cr^{3+} (Q)   11
    in acidic medium

(C) When FeS_2 converted into Fe_2O_3 and   (R)   2
    SO_2

(D) When $Mn(NO_3)_2$ converted into   (S)   10
    MnO_4^{2-} and NO

2.

▶ Watch Video Solution

Column-I		Column-II
(A) $P_4H_2 \longrightarrow PH_3 + P_4H_2$	(P) $E = \dfrac{3M}{4}$	
(B) $I_2 \longrightarrow I^- + IO_3^-$	(Q) $E = \dfrac{3M}{5}$	
(C) $MnO_4^- + Mn^{2+} + H_2O$ $\longrightarrow Mn_3O_4 + H^+$	(R) $E = \dfrac{15M}{26}$	
(D) $H_3PO_2 \longrightarrow PH_3 + H_3PO_3$	(S) $E = \dfrac{5M}{6}$	

3.

▶ Watch Video Solution

1. STATEMENTS-1 : Specific gravity is dimensionless.

STATEMENTS-2 : Specific gravity is density of a substance measured w.r.t. density of water at $4°C$.

A. If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ Watch Video Solution

2. Molality of pure water is.................. .

A. A.If both the statement are TRUE and STATEMENT -2 is the correct

explanation of STATEMENT-1

B. B.If both the statement are TRUE but STATEMENT-2 is NOT the

correct explanation of STATEMENT-1

C. C.If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. D.If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

---

3. STATEMENT-1: Gram molecular mass of O_2 is 32.

STATEMENT-2: Relative atomic mass of oxygen is 32 a.m.u.

- A. If both the statement are TRUE and STATEMENT -2 is the correct
  explanation of STATEMENT-1

- B. If both the statement are TRUE but STATEMENT-2 is NOT the correct
  explanation of STATEMENT-1

- C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

- D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

4. STATEMENT-1: The oxidation state of S in $H_2S_2O_8$ is 6.

STATEMENT-2: Maximum oxidation state of A is 6 because the maximum oxidation state of an element is equal to number of its valence electrons in it.

A. If both the statement are TRUE and STATEMENT -2 is A.the correct explanation of STATEMENT-1

B. B.If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. C.If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. D.If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ Watch Video Solution

5. STATEMENT-1: $0.1MH_3PO_3$(aq) solution has normality equal to 0.3 N when completely reacted with NaOH.

STATEMENT-2 : H_3PO_3 is a dibasic acid.

A. A.If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

B. B.If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. C.If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. D.If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: D

▶ Watch Video Solution

6. STATEMENT-1 : MnO_2 can act as an oxidizing agent as well as reducing agent.

STATEMENT-2 : Oxidation state of MnO_2 lies between highest and lowest oxidation state.

A. If both the statement are TRUE and STATEMENT -2 is the correct

   explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

   explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ **Watch Video Solution**

---

7. STATEMENT-1 : Equivalent volume of H_2 is 11.2 L at 1 atm and 273 K.

STATEMENT-2 : $1/2$mole H_2 has produced when 1 mole of H^+ (aq)

accepted 1 mole of e^-.

A. If both the statement are TRUE and STATEMENT -2 is the correct

   explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

   explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ **Watch Video Solution**

---

8. STATEMENT-1 : For the reaction in titration

$Na_2CO_3 + HCL \rightarrow NaCl + NaHCO_3,$ the suitable indicator is

phennophthalein.

STATEMENT-2 : Phenolphthalein provide its colour in acidic medium.

A. If both the statement are TRUE and STATEMENT -2 is the correct

   explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

   explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

▶ Watch Video Solution

---

9. STATEMENT-1 : $[Fe(CN)_6]^4 \to Fe^{3+} + CO_2 + NO_3^-$, the equivalent mass of reactant is 3.74.

STATEMENT-2 : "Equivalent mass of reactant" = $\dfrac{\text{Mol.mass}}{61}$.

A. A.If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

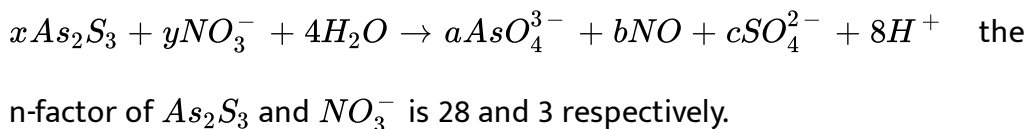B. B.If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. C.If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. D.If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: D

---

10. STATEMENT-1 : In the balanced redox reaction,

$$xAs_2S_3 + yNO_3^- + 4H_2O \rightarrow aAsO_4^{3-} + bNO + cSO_4^{2-} + 8H^+ \quad \text{the}$$

n-factor of As_2S_3 and NO_3^- is 28 and 3 respectively.

Statement-2 : Molar ratio is reciprocal of n-factor's ratio so $x:y$ is $3:28$.

A. If both the statement are TRUE and STATEMENT -2 is the correct

explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

11. STATEMENT-1 : In the given reaction, $NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$ equivalent mass of H_3PO_4 is $M/3$

STATEMENT-2 : H_3PO_4 is tribasic acid.

A. A.If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

B. B.If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. C.If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE
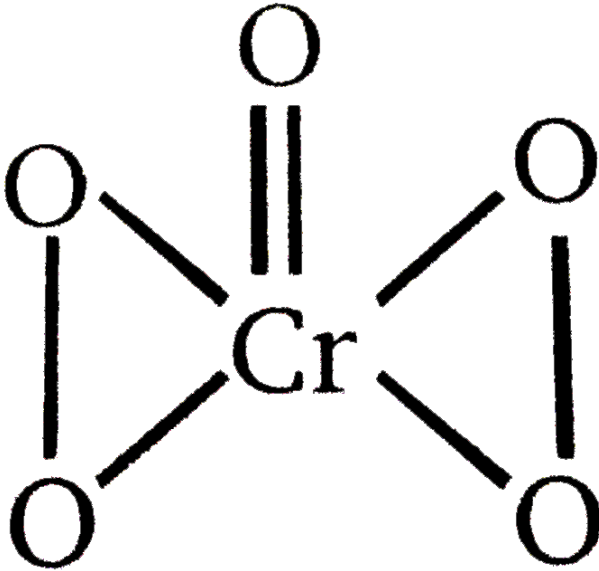
D. D.If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: D

▶ **Watch Video Solution**

12. STATEMENT-1: In CrO_5 oxidation number of Cr is +6.

STATEMENT-2 : CrO_5 has butterfly structure in which peroxide peroxide bonds are present.

A. If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ Watch Video Solution

---

13. STATEMENT-1 : $I_2 \rightarrow IO_3^- + I^-$, is example of a disproportionation reaction.

STATEMENT-2 : Oxidation number of I can vary from -1 to $+7$.

A. If both the statement are TRUE and STATEMENT -2 is the correct explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

14. Assertion: Fluorine exists only in -1 oxidation state.

Reason: Fluorine has $2s^2 2p^5$ configuration.

    A. If both the statement are TRUE and STATEMENT -2 is the correct

        explanation of STATEMENT-1

    B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

        explanation of STATEMENT-1

    C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

    D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

15. STATEMENT-1 : $H_2 SO_4$ can not act as reducing agent.

STATEMENT-2 : Sulphur can not increase its oxidation number beyond $+6$.

A. If both the statement are TRUE and STATEMENT -2 is the correct

   explanation of STATEMENT-1

B. If both the statement are TRUE but STATEMENT-2 is NOT the correct

   explanation of STATEMENT-1

C. If STATEMENT- is 1 TRUE and STATEMENT-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

▶ **Watch Video Solution**

Level 3 - Subjective Problems

1. What volume of a liquid (in L) will contain 10 mole ? If molar mass of

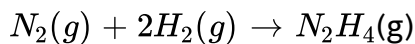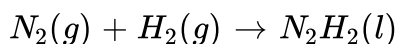liquid is 280 and its density is 1.4 g/mL.

▶ **Watch Video Solution**

2. 16 g of SO_x gas occupies 5.6 L at 1 atm and 273 K.What will be the value of x ?

3. 200 mL of 1 HCl, is mixed with 300 mL of 6 M and the final solution is diluted to 1000 mL.calculate molar concentration of $[H^+]$ ion .

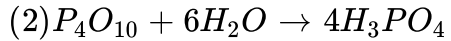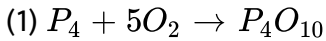**4.** N_2(g) reacts with H_2(g) in either of the following ways depending upon supply of H_2(g) :

$$N_2(g) + H_2(g) \rightarrow N_2H_2(l)$$

$$N_2(g) + 2H_2(g) \rightarrow N_2H_4(g)$$

If 5 L N_2(g) and 3 L H_2(g) are taken initially (at same temperature and pressure), calculate the contraction in valume after the reaction (in L).

5. Phospheric acid (H_3PO_4) perpared in two step process .

(1) $P_4 + 5O_2 \rightarrow P_4O_{10}$ (2) $P_4O_{10} + 6H_2O \rightarrow 4H_3PO_4$
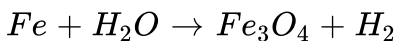
Well allow 62 g of phosphrous to react with exces oxygen which from

P_4O_{10} in 85% yield . In the sep (2) reaction 90% yield of $H_3)PO_4$ is

obtained . Mass of H_3PO_4 produced is :

▶ Watch Video Solution

---

6. W is the mass of iron (in g) which will be converted into Fe_3O_4 by the

action of 18 g of steam on it . What is the value of W/7 ?

$Fe + H_2O \rightarrow Fe_3O_4 + H_2$

▶ Watch Video Solution

---

7. Calculate the total moles of atoms of each element present in 122.5 g of

$KCLO_3$

▶ Watch Video Solution

8. On dissolving 2.0 g of metal in sulphuric acid ,4.51 g of the metal sulphate was formed . The specific heat of the metal is 0.057 cal $g^{-1}.^{\circ}C^{-1}$. What is the valency of metal ?

▶ Watch Video Solution

9. One gram of a metallic chloride was found to contain 0.835 g of chlorine. Its vapour density is 85.5.If its moleculars formula is M_xCl_y,then what is value of (x+y) ?

▶ Watch Video Solution

10. Calculate number of gram atoms in 103g of KOH.

▶ Watch Video Solution

11. The emperical formula of the sucrose is:

A. CH2O

B. CHO

C. C12H22O11

D. CH2O2

Answer: 5

> ▶ Watch Video Solution

12. The number of atoms of He in 104 amu is:

> ▶ Watch Video Solution

13. When BrO_3^- ion reacts with Br^- ion in acidic medium, Br_2 is liberated. Calculate the ratio of molecular mass and equivalent mass of $KBrO_3$

> ▶ Watch Video Solution

14. A volume of 12.5 mL of 0.05 M SeO_2 reacts with 25 mL of 0.1 M $CrSO_4$ which is oxidised to Cr^{3+}. To what oxidation state was the selenium converted by the reaction ?
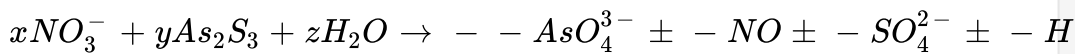
▶ Watch Video Solution

15. A 0.276 g impure sample of copper ore is dissolved and Cu^{2+} is titrated with KI solution. I_2 liberated required 40 mL of 0.1 M $Na_2\,S_2\,O_3$ solution for titration. What is the % of impurities in the ore ?

▶ Watch Video Solution

16. A sample of 28 mL of $H_2\,O_2$ (aq) solution required 10 mL of 0.1 M $KMnO_4$ (aq) solution for complete reaction in acidic medium. What is the volume strength of H_2O_2 ? X

▶ Watch Video Solution

17. For the redox reaction given, what is the value of $\frac{x}{z}$?

$$xNO_3^- + yAs_2S_3 + zH_2O \rightarrow -- AsO_4^{3-} \pm - NO \pm - SO_4^{2-} \pm - H$$

.

18. On heating 0.220 g of a metallic oxide in presence of hydrogen,0.045 g of water is formed. If the equivalent mass of the metal is E,then what is the value of E/9

19. 10 g mixture of $K_2Cr(2)O_7$ and $KMnO_4$ was treated with excess of KI in acidic medium. Iodine liberated $100cm^3$ of 2.2 N sodium thiosulphate solution for titration. If the mass percent of $KMnO_4$ in the mixture Z, then what is the value of 2Z/5 ?

20. In an ore, the only oxidizable material is Sn^{2+}. This ore is titrated with a dichromate solution containing $2.5g$ of $K_2Cr_2O_7$ in 0.5litre. A $0.40g$ sample of the ore required $10.0cm^3$ of titrant to reach equivalence point. Calculate the percentage of tin in ore.

▶ Watch Video Solution

Others

1. Hydrogen and oxygen combine to from H_2O_2 and H_2O containing 5.93% and 11.2% hydrogen respectively . The data illustrates :

▶ Watch Video Solution

2. Which one the following combinations illustrate law of reciprocal proportions ?

▶ Watch Video Solution

3. The law of multiple proportion is illustrated by the two compounds a) Sulphur dioxide and Sulphur trioxide :

4. A bottle of an aqueous H_2O_2 solution is labelled as $'28V'H_2O_2$ and the density of the solution $\left(\in \frac{g}{m}L \right)$ is 1.25. Choose the corrects option : A) Molality of H2O2 is 2 B) Molarity of H2O2 is 5 C) Molality of H2O2 is 2.15 D) None of these

5. $AI_2(SO_4)_3$ solution of 1 molal concentration is present in 1 litre solution of density $2.684\frac{g}{m}l$. How many moles of $BaSO_4$ would be precipitated on adding excess of $BaCI_2$ in it ?

6. A certain public water supply contains $0.10ppb$ (part per billion) of chloroform $(CHCl_3)$. How many molecules of $CHCl_3$ would be obtained in $0.478mL$ drop of this water ?(assumed $d = 1\dfrac{g}{m}L$)

▶ Watch Video Solution

7. What is the molar mass of diacidic organic Lewis base (B), if $12g$ of its chloroplatinate salt (BH_2PtCl_6) on ignition produced $5g$ residue of Pt ?

▶ Watch Video Solution

8. On strongs heating, One gram of the silver salt of an organic dibasic acid yields $0.5934g$ of silver. If the mass percentage of carbon in it 8 times the mass percentage of hydrogen and one - half the mass percentage of oxygen, determine the molecular formula of the acid.

▶ Watch Video Solution

9. $40mL$ gaseous mixture of CO, CH_4 and Ne was exploded with $10mL$ of oxygen. After treatment with KOH the volume reduced by $9mL$ and again on treatment with alkaline pyrogallol, the volume further reduced by 1.5 mL. percentage of CH_4 in the original mixture is :

▶ Watch Video Solution

10. A gaseous mixture of propane and butane of volume 3 litre on complete combustion produces 11.0 litre CO_2 under standard conditions of temperature and pressure. The ratio of volume of butane to propane is :

▶ Watch Video Solution

11. Phosphorous has the oxidation state of $+1$ in :

▶ Watch Video Solution

12. $40mL$ gaseous mixture of CO, CH_4 and Ne was exploded with $10mL$ of oxygen. After treatment with KOH the volume reduced by $9mL$ and again on treatment with alkaline pyrogallol, the volume further reduced by 1.5 mL. percentage of CH_4 in the original mixture is :

13. Fe shows an oxidation state of $+1$ in :

14. When SO_2 is passed into an acidified potassium dichromate solution, the oxidation numbers of sulphur and chromium in the final products respectively are :
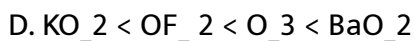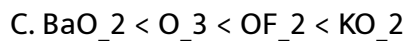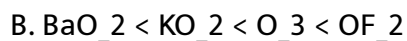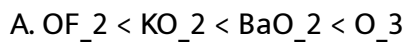
15. Fe shows an oxidation state of $+1$ in :

16. In which of the follwoing the oxidation number of oxygen has been arranged in increasing order

    A. OF_2 < KO_2 < BaO_2 < O_3

    B. BaO_2 < KO_2 < O_3 < OF_2

    C. BaO_2 < O_3 < OF_2 < KO_2

    D. KO_2 < OF_ 2 < O_3 < BaO_2

17. The oxidation numbers of oxygen in KO_3, Na_2O_2 respectively are :

18. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is :

19. If it is known that $Fe_{0.96}O$, Fe is present in $+2$ and $+3$ oxidation state, What is the mole fraction of Fe^{2+} in the compound ?

20. Which of the following sequence of compounds is according to the decreasing order of the oxidation state of nitrogen ?

A. HNO3,NO,N2.NH4Cl

B.

C.

D. HNO3,NH4Cl,NO,N2

21. 2 mole of N_2H_4 loses 16 mole of electron is beings converted to a new compound X. Assuming that all of the N appears in the new compound. What is the oxidation state of 'N' in X ?

22. When SO_2 is passed into an acidified potassium dichromate solution, the oxidation numbers of sulphur and chromium in the final products respectively are :

23. When a manganous salt is fused with a mixture of KNO_3 and solid $NaOH$, the oxidation number of Mn change from $+2$ to :
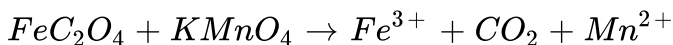
24. The oxidation number of nitrogen atoms in NH_4NO_3 are :

▶ Watch Video Solution

25. In $Fe(II) - MnO_4^-$ titration, HNO_3 is not used because :

▶ Watch Video Solution

26. Which species are oxidized and reduced in the reaction ?

$$FeC_2O_4 + KMnO_4 \rightarrow Fe^{3+} + CO_2 + Mn^{2+}$$
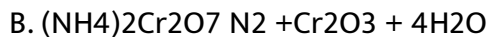
▶ Watch Video Solution
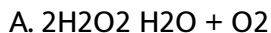
27. H_2O_2` is acting as a reducing agent as well as oxidising agent

▶ Watch Video Solution

28. Calculate the mass of 1.5gram atoms of calcium?

29. Which reaction does represent auto redox or disproportionation ?

A. $2H_2O_2$ H_2O + O_2

B. $(NH_4)_2Cr_2O_7$ N_2 +Cr_2O_3 + $4H_2O$

C.

D.

30. Which of the following is redox reaction ?

A. Zn + $2AgCN$ 2 Ag+ Zn(CN)2

B.

C. N2O5 +H2O 2HNO3

D.

---
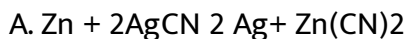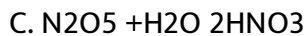
31. Which of the following is redox reaction ?

---

32. For the redix reaction,

$$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$$
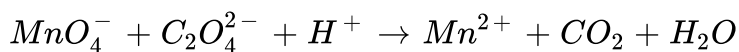
the correct coefficients of the reactants for the balanced reaction are respectively $MnO_4^- + C_2O_4^{2-}, H^+,$

A. (a) 2, 16, 5

B. (b) 16, 5, 2

C. (c) 5, 16, 2

D. (d) 2, 5, 16

33. If 0.1 mole H_3PO_x is completely neutralised by 5.6g KOH then select the true statement.

34. When potassium permanganate is titrated against ferrous ammonium sulphate in acidic medium, the equivalent mass potassium permanganate is ,

35. Equivalent mass of FeS_2 inthe half reaction, $FeS_2 \rightarrow Fe_2O_3 + SO_2$ is :

36. The equaivalent mass of HCI in the given reaction is :

$$K_2Cr_2O_7 + 14HCI \rightarrow 2KCI + 2CrCI_3 + 3CI_2 + H_2O$$

37. Equivalent mass of H_3PO_2 when it disproportionate into PH_3 and H_3PO_3 is:

38. In the following reaction,

$As_2S_3 + H^+ + NO_3^- \dashrightarrow NO + H_2O + AsO_4^{3-} + SO_4^{2-}$ the equivalent

mass of As_2S_3 is related to its molecular mass by :

> ▶ Watch Video Solution

39. Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is :

> ▶ Watch Video Solution

40. The equaivalent mass of an element is 4. Its chloride has a vapour density 59.25. Then, the velency of the elements is :

> ▶ Watch Video Solution

41. 6×10^{-3} mole $K_2Cr_2O_7$ reacts completely with 9×10^{-3} mole X^{n+} to given XO_3^- and $Cr \char`\^ (3+)$. The value of n is :

> ▶ Watch Video Solution

42. What mass of $H_2C_2O_4 \cdot 2H_2O$ (mol.mass $= 126$) should be dissolved in water to prepare $250mL$ of centinormal solution which act as a reducing agent ?

▶ Watch Video Solution

43. The equivalent mass of the salt, $KHC_2O_4 \cdot H_2C_2O_4 \cdot 4H_2O$ when it act as reducing agent is :

▶ Watch Video Solution

44. The eequivalent mass of divalent metal is W. The molecular mass of its chloride is :

▶ Watch Video Solution

45. When BrO_3^- iron reacts with Br^- in acid medium, Br_2 is liberated. The equivalent mass of Br_2 in this reaction is :

> ▶ Watch Video Solution

46. If M_A gram of metal A displaces m_B gram of another metal B from its salt solution and if the equivalent mass are E_A and E_B respectively then equivalent mass of A can be expressed as :

> ▶ Watch Video Solution

47. What will be the normality of solution obtained by mixining $0.45N$ and $0.60NNaOH$ in the ratio $2:1$ by volume ?

> ▶ Watch Video Solution

48. Calculate the gram atoms in 12.8g of oxygen ?

49. $1.25g$ of a solid dibasic acid is completely neutralised by $25mL$ of 0.25 molar Ba $(OH)_2$ solution. Molecular mass of the acid is :

50. $10mL$ of an $N - HCI$, $20mL$ of $\dfrac{N}{2}H_2SO_4$ and $30mL$ of $\dfrac{N}{3}HNO_3$ are mixed together and volume made to one litre. The normality of H^+ in the resulting solution is :

51. $0.45g$ of an acid of mol. Mass 90 was neutralised by $20mL$ of $0.5N$ caustic potash (KOH). The basicity of acid is :

52. A $3.4g$ sample of H_2O_2 solution containing $x\%\,H_2O$ by mass requires xmL of a $KMnO_4$ solution for complete oxidation under acidic conditions. The normality of $KMnO_4$ solution is :

> ▶ Watch Video Solution

53. A solution is prepared by adding 60g of methyl alcohol to 120g of water. calculate the mole fraction of methanol and water?

> ▶ Watch Video Solution

54. $KMnO_4$ reacts with oxalic acid according to the equation

$2MnO_4 + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$ Here, $20mL$ of $0.1MKHMnO_4$ is equivalent to :

A. (a) $20mLof0.5MH_2C_2O_4$

B. (b) $50mLof0.1MH_2C_2O_4$

C. (c) $50mLof0.5MH_2C_2O_4$

D. (d) $20 mL of 0.1 M H_2C_2O_4$

55. Ratio of moles of Fe (II) oxidised by equal volumes of equimolar $KMnO_4$ and $K_2Cr_2O_7$ solutions in aidic medium will be :

56. The mass of a mixture containing HCI and H_2SO_4 is $0.1g$ On treatment with an excess of an $AgNO_3$ solution , reacted with this acid mixture given $0.1435g$ of $AgCI$. Mass % of the H_2SO_4 mixture is :

57. A solution of $Na_2S_2O_3$ is standardized iodometrically against $0.167g$ of $KBrO_3$. This process requires $50mL$ of the $Na_2S_2O_3$ solution. What

is the normality of the $Na_2S_2O_3$. ?

58. $0.80g$ is impure $(NH_4)SO_4)$ was boiled with $100mL$ of $0.2NNaOH$ solution till all the $NH_3(g)$ evolved. The remaining solution was diluted to $250mL$. $25mL$ of this solution was neutralized using $5mL$ of $0.2NH_2SO_4$ solution. The percentage purity of the $(NH_4)_2SO_4$ sample is :

59. The NH_3 evolved due to complete conversion of N from $1.12g$ sample of protien was absorbed in $45mL$ of $0.4NHNO_3$. The excess acid required $20mL$ of $0.1NaOH$. The % N in the sample is :

60. Find out % of oxalate ion in a given sample of an alkali metal oxalate salt, $0.30g$ of it is dissolved in $100mL$ water and its required $90mL$ of centimolar $KMnO_4$ solution in acidic medium :

▶ Watch Video Solution

61. $320mg$ of sample of magnesium having a coating of its oxide required $20mL$ of $0.1M$ hydrochloric acid for the complete neutralisation of the latter. The composition of the sample is :

▶ Watch Video Solution

62. The concentration of bivalent lead ions in sample of polluted water that also contains nitrate ions is determined by adding solid sodium sulphate $(m = 142)$ to exacty $500mL$ water 500mL $water. Calcatethemolarityof keadion$ if 0.355g` of solium sulphate was needed for complete precipitation of lead ions as sulphate.

▶ Watch Video Solution

63. What volume of HNO_3 (sq.gravity $1.05 gmL^{-1}$ containing $12.6\left(\dfrac{w}{W}\right)$ of HNO_3) that reduce into NO is required to oxidise iron $gFeSO_4. 7H_2O$ in acid medium is :

▶ **Watch Video Solution**

64. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requires x mole of $KMnO_4$ in acidic medium for complete oxidation. x is :

▶ **Watch Video Solution**

65. When $2.5 g$ of a sample of mohr's salt reacts completely with $50 mL$ of $\dfrac{N}{10} KMnO_4$ solution. The % purity of the sample of Mohr's salt is :

▶ **Watch Video Solution**

66. 4 mole of a mixture of Mohr's salt and $Fe_2(SO_4)_3$ requires $500 mL$ of $1M K_2Cr_2O_7$ for complete oxidation in acidic medium. The mole % of the Mohr's salt in the mixture is :

▶ Watch Video Solution

67. The equivalent mass of a metal is twice to that of oxygen. How many times is the equivalent mass of it's oxide than the equivalent mass of the metal ?

▶ Watch Video Solution

68. A metal oxide has the formula X_2O_3. It can be reduced by hydrogen to give free metal and water. $0.1596g$ of metal oxide requires $6mg$ of hydrogen for complete reduction. The atomic mass of the metal (in amu) is :

▶ Watch Video Solution

69. Calculate the mass of anhydrous oxalic acid, which can be oxidised to $CO_2(g)$ by $100mL$ of an MnO_4^- solution, $10mL$ of which is capable of oxiding $50mL$ of $1NI^-$ to I_2.

70. A mixture of $NaHC_2O_4$ and $KHC_2O_4.H_2C_2O_4$ required equal volumes $0.2NKMnO_4$ and $0.12NNaOH$ separately. What is the molar ratio of $NaHC_2O_4$ and $KHC_2O_4.H_2C_2O_4$ in the mixture ?

71. Calculate the volume of 0.015M HCl solution required to prepare 250ml of a 5.25 (10)-3 M HCl solution ?

72. 2 mole, equimolar mixture of $Na_2C_2O_4$ and $H_2C_2O_4$ required V_1L of $0.1MKHMO_4$ in acidic medium for complete oxidation. The same amount of the mixture required V_2L of $0.2MNaOH$ for neutralization. The ratio of $V_1 \rightarrow V_2$ is :

▶ Watch Video Solution

73. A mixture containing 0.05 mole of $K_2Cr_2O_7$ and 0.02 mole of $KMnO_4$ was treated with excess of KI in acidic madium. The librated iodine required $1.0L$ of NaS_2O_3 solution for titration. Concentration of $Na_2S_2O_3$ solution was :

▶ Watch Video Solution

74. $25mL$ of $2NHCI$, $50mL$ of $4NHNO_3$ and xmL of $2MH_2SO_4$ are mixed together and the total volume is made up to $1L$ after dilution. $50mL$ of this acid mixture completely reacted with $25mL$ of a $1Na_2CO_3$ solution. The value of x is :

75. $1g$ mixture of equal number of mole of Li_2Co_3 and other metal carbonate (M_2CO_3) required $21.6mL$ of $0.5NHCI$ for complete neutralisation reaction. What is the approximate atomic mass of the other metal ?

76. 250ml of a 1.5M solution of sulphuric acid is diluted by adding 5L of water. what is the molarity of the diluted solution?

77. $0.1g$ of a solution containing Na_2CO_3 and $NaHCO_3$ requires $10mL$ of $0.01NHCI$ for neutralization using phenolphthalein as an indicator. mass % of Na_2CO_3 in solution is :

78. A jug contains 2L of milk. calculate the milk in m3.

79. $10L$ of hard water required $5.6g$ of lime for removing haardness.

Hence temporary hardness in ppm of $CaCO_3$ is :

80. $1L$ of pond water contains $20mg$ of Ca^{2+} and $12mg$ of mg^{2+} ions.

What is the volume of a $2NNa_2CO_3$ solution required to soften $5000L$

of pond water ?

81. One litre of a sample of hard water contain $4.44 mg CaCl_2$ and $1.9 mg of MgCl_2$. What is the total hardness in terms of ppm of $CaCO_3$?

▶ Watch Video Solution

82. If hardness of water sample is $200 parts per million$, Calculate the mass ratio of CaCO3 to water is:

▶ Watch Video Solution

83. A mixture of NH_4NO_3 and $(NH_4)_2HPO_4$ contain 30.40% mass per centof nitrogen. What is the mass ratio of the two components in the mixture ?
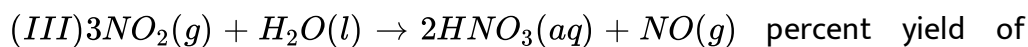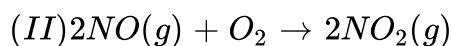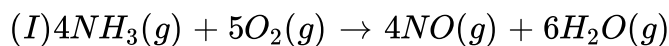
▶ Watch Video Solution

84. What volume of 75% acohol by weight $\left(d = 0.80\dfrac{g}{c}m^3\right)$ must be used to prepare $150cm^3$ of 30% alcohol by mass $\left(d = 0.90\dfrac{g}{c}m^2\right)$?

▶ Watch Video Solution

85. $6.2g$ of a sample containing Na_2CO_3, $NaHCO_3$ and non-volatile inert impurity on gentle heating loses 5% of its mass due to reaction $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$. Residue is dissolved in water and formed $100mL$ solution and its $10mL$ portion requires $7.5mL$ of $0.2M$ aqueous solution of $BaCI_2$ for complete precipitation of carbonates. Determine mass (in gram) of Na_2CO_3 in the original sample.

▶ Watch Video Solution

86. Nitric acid can be produced from NH_3 in three steps process below

$(I)4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$

$(II)2NO(g) + O_2 \rightarrow 2NO_2(g)$

$(III)3NO_2(g) + H_2O(l) \rightarrow 2HNO_3(aq) + NO(g)$ percent yield of

1st, 2nd and 3rd step are respectively 50 % , 60 % and 80 % respectively then what volume of $NH_3(g)$ at 1 atm and $0°C$ required to produced 1575g of HNO_3.

> ▶ Watch Video Solution

87. How much copper can be obtained from 100g of copper sulphate ?

> ▶ Watch Video Solution

88. MnO_2 on ignition converts into Mn_3O_4. A sample of pyrolusite having 75% MnO_2, 20% inert impurities and rest water is ignited in air to constant mass. What is the percentage of Mn in the ignited sample ?

> ▶ Watch Video Solution

89. What is the ratio by mass of N and H in NH_3

> ▶ Watch Video Solution

90. Calculate the wavelength of an electron moving with a velocity of 2.05×10 7 ms −1

91. $11.6g$ of an organic compound having formula C_nH_{2n+2} is burnt in excess of $O_2(g)$ initially taken in a 22.41 litre steel vessel. Before reactio0n the gaseous mixture was at $273K$ with pressure reading 2 atm. Aftercomplete combustion and loss of considerable amount of heat, the mixture of product and excess of O_2 had a temperature of $546K$ and 4.6 atm pressure. The formula of organic compound is :

92. Calculate the no of moles of iodine in a sample containing 1 (10) 22 molecules.

93. SO_2CI_2 (sulphury chloride) reacts with water to given a mixture of H_2SO_4 and HCI. What volume of $0.2MBa(OH)_2$ in needed to completely neutralize $25mL$ of $0.2MSO_2CI_2$ solution :

94. Calculate the mass percentage composition of copper pyrite.

95. 20 mL of 0.2 M NaOH(aq) solution is mixed with 35 mL of this 0.1 ML NaOH (aq) solution and the resultant solution is diluted to 100 mL. 40 mL of this diluted solution reacted with 10% impure sample of oxalic acid $(H_2C_2O_4)$ The mass of impure is:

96. Two elements X (at.mass 16) and Y (at.mass 14) combine to form compounds A, B and C. The ratio be different masses of Y which combine with a fixed mass of X in A, B and C is $1:3:5$. If 32 parts by mass of X combines with 84 parts by mass of Y in B then in C, 16 parts by mass of X will combine with :

   A. (a) 14 parts by mass of Y

   B. (b) 42 parts by mass of Y

   C. (a) 70 parts by mass of Y

   D. (d) 84 parts by mass of Y

▶ Watch Video Solution

97. The conversion of oxygen to ozone occurs to the extent of 15% only. Find mass of ozone that can be prepared from $67.2L$ of oxygen at 1 atm and $273K$ will be :

▶ Watch Video Solution

98. RH_2 (ion exchange resin) can replace Ca^{2+} ions in hard water as $RH_2 + Ca^{2+} \rightarrow RCa + 2H^+$. If 1 L of hard water after passing through RH_2 has $pH = 3$ then hardness in parts per million of Ca^{2+} is :

99. $20mL$ of $0.1M$ solution of compound $Na_2CO_3. 2H_2O$ is titrated against $0.05MHCI$. xmL of HCI is used when phenolphthalein is used as an indicator and y mL of HCl is used when methly orange is the indicator in two separate titrations. Hence $(y - x)$ is :

100. A sample containing $HAsO_2$ (mol. mass $= 180$) and weighing $3.78g$ is dissolved and diluted to $250mL$ in a volumetric flask. $A 50mL$ sample

(aliquat) is withdrawn with a pipet and titrated with $35mL$ of $0.05M$ solution of I_2. Calculate the percentage $HAsO_2$ in the sample :

101. A mixture of FeO and Fe_2O_3 is completely reacted with $100mL$ of $0.25M$ acidified $KMnO_4$ solution. The resulting solution was then treated with Zn dust which converted Fe^{3+} of the solution to fe^{2+}. The $Fe^{2=}$ required $100mL$ of $0.10MK_2Cr_2O_7$ solution. Find out the weight % Fe_2O_3 in the mixture.

102. Calculate number of gram atoms in 669.6 g of iron?

103. The relative abundance of various isotopes of silicon is as:Si-28=92.23%,Si-29=4.67% and Si-30=3.10%. Calculate the average atomic mass of silicon.

▶ Watch Video Solution

104. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requires x mole of $KMnO_4$ in acidic medium for complete oxidation. x is :

▶ Watch Video Solution

105. when an aqueous solution of H_2SO_4 is electrolysed the product at anodes is :

▶ Watch Video Solution

106. A mixture containing 0.05 mole of $K_2Cr_2O_7$ and 0.02 mole of $KMnO_4$ was treated with excess of KI in acidic madium. The librated iodine required $1.0L$ of NaS_2O_3 solution for titration. Concentration of $Na_2S_2O_3$ solution was :

▶ **Watch Video Solution**

107. A mixture containing 0.05 mole of $K_2Cr_2O_7$ and 0.02 mole of $KMnO_4$ was treated with excess of KI in acidic madium. The librated iodine required $1.0L$ of NaS_2O_3 solution for titration. Concentration of $Na_2S_2O_3$ solution was :

▶ **Watch Video Solution**

108. A mixture of H_2SO_4 and $H_2C_2O_4$ (oxalic acid) and some inert impurity weighing 3.185 g was dessolved in water and the solution made up to 1litre. 10 mL of this solution required 3 mL of 0.1 N NaOH for complete neutralization. In another experiment 100 mL of the same

solution in hot condition required 4 mL of 0.02 M $KMnO_4$ solution for complete reaction. The mass % of H_2SO_4 in the mixture was: