

**Atoms Molecule and Chemical Arithmetic Assignment**

1. In the final answer of the expression  $\frac{(29.2 - 20.2)(1.79 \times 10^5)}{1.37}$ . The number of significant figures is  
 (a) 1 (b) 2 (c) 3 (d) 4
2. 81.4 g sample of ethyl alcohol contains 0.002 g of water. The amount of pure ethyl alcohol to the proper number of significant figures is  
 (a) 81.398 g (b) 81.40 g (c) 81.4 g (d) 81 g
3. The unit  $J Pa^{-1}$  is equivalent to  
 (a)  $m^3$  (b)  $cm^3$  (c)  $dm^3$  (d) None of these
4. From the following masses, the one which is expressed nearest to the milligram is  
 (a) 16 g (b) 16.4 g (c) 16.428 g (d) 16.4284 g
5. The number of significant figures in  $6.02 \times 10^{23}$  is  
 (a) 23 (b) 3 (c) 4 (d) 26
6. Equal weights of oxygen and methane are mixed together in a container at room temperature then the pressure exerted by oxygen will be  
 (a)  $\frac{2}{3}$  (b)  $\frac{1}{2}$  (c)  $\frac{1}{3}$  (d)  $\frac{1}{4}$
7. Assuming fully decomposed, the volume of  $CO_2$  released at STP on heating 9.85g of  $BaCO_3$  (Atomic mass, Ba=137) will be  
 (a) 0.84 L (b) 2.24 L (c) 4.06 L (d) 1.12 L
8. If  $N_A$  is Avogadro's number then number of valence electrons in 4.2 g of nitride ions ( $N^{3-}$ )  
 (a)  $2.4 N_A$  (b)  $4.2 N_A$  (c)  $1.6 N_A$  (d)  $3.2 N_A$
9. The weight of  $1 \times 10^{22}$  molecules of  $CuSO_4 \cdot 5H_2O$  is  
 (a) 41.59 g (b) 415.9 g (c) 4.159 g (d) None of these
10. Rearrange the following (I to IV) in the order of increasing masses and choose the correct answer from (a), (b), (c) and (d) (Atomic mass: N=14, O=16, Cu=63).  
 I. 1 molecule of oxygen  
 II. 1 atom of nitrogen  
 III.  $1 \times 10^{-10}$  g molecular weight of oxygen  
 IV.  $1 \times 10^{-10}$  g atomic weight of copper  
 (a) II<I<III<IV (b) IV<III<II<I (c) II<III<I<IV (d) III<IV<I<II
11. 1.520 g of the hydroxide of a metal on ignition gave 0.995 of oxide. The equivalent weight of metal is  
 (a) 1.520 (b) 0.995 (c) 19.00 (d) 9.00
12. How much coulomb charge is present on 1g  $N^{3-}$   
 (a)  $5.2 \times 10^{16}$  Coulomb (b)  $2.894 \times 10^{15}$  Coulomb (c)  $6.6 \times 10^{18}$  Coulomb (d)  $8.2 \times 10^{19}$  Coulomb
13. Ratio of  $C_p$  and  $C_v$  of a gas X is 1.4, the number of atom of the gas 'X' present in 11.2 litres of it at NTP will be  
 (a)  $6.02 \times 10^{23}$  (b)  $1.2 \times 10^{23}$  (c)  $3.01 \times 10^{23}$  (d)  $2.01 \times 10^{23}$
14. What is the total number of electrons in 1.0 g of  $CH_4$   
 (a)  $6 \times 10^{23}$  (b)  $.10 \times 10^{-23}$  (c)  $.5 \times 10^{11}$  (d) None of these
15. Weight of the metal obtained on heating 2 gm of a atomic weight of the metal will be (valency =2)  
 (a) 24 (b) 96 (c) 48 (d) 100
16. What should be the equivalent weight of phosphorous acid, if P=31; O=16; H=1  
 (a) 82 (b) 41 (c) 20.5 (d) None of these
17. The number of molecule at NTP in 1 ml of an ideal gas will be  
 (a)  $6 \times 10^{23}$  (b)  $2.69 \times 10^{19}$  (c)  $2.69 \times 10^{23}$  (d) None of these
18. The specific heat of a metal is 0.16 its approximate. Atomic weight would be  
 (a) 32 (b) 16 (c) 40 (d) 64
19. The weight of a molecule of the compound  $C_{60}H_{122}$  is  
 (a)  $1.4 \times 10^{-21}$  g (b)  $1.09 \times 10^{-21}$  g (c)  $5.025 \times 10^{23}$  g (d)  $16.023 \times 10^{23}$  g
20. What is the weight of oxygen required for the complete combustion of 2.8 kg of ethylene  
 (a) 2.8 kg (b) 6.4 kg (c) 9.6 kg (d) 96 kg
21. What volume of  $NH_3$  gas at STP would be needed to prepare 100ml of 2.5 molal (2.5m) ammonium hydroxide solution

## GRAVITY CLASSES

- (a) 0.056 litres (b) 0.56 litres (c) 5.6 litres (d) 11.2 litres
22. What should be the weight of 50%  $HCl$  which reacts with 100 g of limestone  
(a) 50% pure (b) 25% pure (c) 10% pure (d) 8% pure
23. What should be the weight and moles of  $AgCl$  precipitate obtained on adding 500ml of 0.20 M  $HCl$  in 30 g of  $AgNO_3$  solution? ( $AgNO_3 = 170$ )  
(a) 14.35 g (b) 15 g (c) 18 g (d) 19 g
24. A solution of 10 ml  $\frac{M}{10} FeSO_4$  was titrated with  $KMnO_4$  solution in acidic medium. The amount of  $KMnO_4$  used will be  
(a) 5 ml of 0.1 M (b) 10 ml of 1.1 M (c) 10 ml of 0.5 M (d) 10 ml of 0.02 M
25. 1.12 ml of a gas is produced at STP by the action of 4.12 mg of alcohol,  $ROH$ , with methyl magnesium iodide. The molecular mass of alcohol is  
(a) 16.0 (b) 41.2 (c) 82.4 (d) 156.0
26. The simplest formula of a compound containing 50% of element X (atomic mass 10) and 50% of element Y (atomic mass 20) is  
(a)  $XY$  (b)  $X_2Y$  (c)  $XY_3$  (d)  $X_2Y_3$
27. The number of moles of oxygen in one litre of air containing 21% oxygen by volume, in standard conditions is  
(a) 0.186 mole (b) 0.21 mole (c) 2.10 mole (d) 0.0093 mole
28. A compound contains atoms of three elements in A, B and C. If the oxidation number of A is +2, B is +5 and that of C is -2, the possible formula of the compound is  
(a)  $A_3(BC_4)_2$  (b)  $A_3(B_4C)_2$  (c)  $ABC_2$  (d)  $A_2(BC_3)_2$
29. What will be the volume of  $CO_2$  at NTP obtained on heating 10 grams of (90% pure) limestone  
(a) 22.4 litre (b) 2.016 litre (c) 2.24 litre (d) 20.16 litre
30. The ratio of the molar amounts of  $H_2S$  needed to precipitate the metal ions from 20mL each of 1M  $Cd(NO_3)_2$  and 0.5M  $CuSO_4$  is  
(a) 1 : 1 (b) 2 : 1 (c) 1 : 2 (d) Indefinite
31. 12g of  $Mg$  (at. mass 24) will react completely with acid to give  
(a) One mole of  $H_2$  (b) 1/2 mole of  $H_2$   
(c) 2/3 mole of  $O_2$  (d) Both 1/2 mol of  $H_2$  and 1/2 mol of  $O_2$
32. 1.5 mol of  $O_2$  combine with  $Mg$  to form oxide  $MgO$ . The mass of  $Mg$  (at. mass 24) that has combined is  
(a) 72 g (b) 36 g (c) 48 g (d) 24 g
33. The mass of 112  $cm^3$  of  $CH_4$  gas at STP is  
(a) 0.16 g (b) 0.8 g (c) 0.08 g (d) 1.6 g
34. Complete combustion of 0.858 g of compound X gives 2.63 g of  $CO_2$  and 1.28 g of  $H_2O$ . The lowest molecular mass X can have  
(a) 43 g (b) 86 g (c) 129 g (d) 172 g
35. The number of equivalents of  $Na_2S_2O_3$  required for the volumetric estimation of one equivalent of  $Cu^{2+}$  is  
(a) 1 (b) 2 (c) 3/2 (d) 3
36. In the following reaction, which choice has value twice that of the equivalent mass of the oxidising agent  
 $SO_2 + H_2O \longrightarrow 3S + 2H_2O$   
(a) 64 (b) 32 (c) 16 (d) 48
37. Vapour density of a gas is 22. What is its molecular mass  
(a) 33 (b) 22 (c) 44 (d) 11
38. Haemoglobin contains 0.33% of iron by weight. The molecular weight of haemoglobin is approximately 67200. The number of iron atoms (At. wt. of  $Fe = 56$ ) present in one molecule of haemoglobin is  
(a) 6 (b) 1 (c) 4 (d) 2
39. What quantity of ammonium sulphate is necessary for the production of  $NH_3$  gas sufficient to neutralize a solution containing 292 g of  $HCl$ ? [ $HCl=36.5$ ;  $(NH_4)_2SO_4 = 132$ ;  $NH_3 = 17$ ]  
(a) 272 g (b) 403 g (c) 528 g (d) 1056 g
40. The percentage of  $P_2O_5$  in diammonium hydrogen phosphate  $(NH_4)_2HPO_4$  is  
(a) 23.48 (b) 46.96 (c) 53.78 (d) 71.00

## GRAVITY CLASSES

41. If  $1\frac{1}{2}$  moles of oxygen combine with *Al* to form  $Al_2O_3$  the weight of *Al* used in the reaction is (*Al*=27)
- (a) 27 g (b) 54 g (c) 49.5 g (d) 31 g
42. The percentage of *Se* in peroxidase anhydrous enzyme is 0.5% by weight (atomic weight=78.4). Then minimum molecular weight of peroxidase anhydrous enzyme is
- (a)  $1.568 \times 10^4$  (b)  $1.568 \times 10^3$  (c) 15.68 (d)  $3.136 \times 10^4$
43. One litre hard water contains 12.00 mg  $Mg^{2+}$  milli equivalent of washing soda required to remove its hardness is
- (a) 1 (b) 12.15 (c)  $1 \times 10^{-3}$  (d)  $12.15 \times 10^{-3}$
44. An aqueous solution of 6.3 g of oxalic acid dihydrate is made up of to 250 ml. The volume of 0.1 N *NaOH* required to completely neutralise 10 ml of this solution is
- (a) 40 ml (b) 20 ml (c) 10 ml (d) 4 ml
45.  $H_2$  evolved at STP on complete reaction of 27 g of Aluminium with excess of aqueous *NaOH* would be
- (a) 22.4 (b) 44.8 (c) 67.2 (d) 33.6 litres
46. What is the % of  $H_2O$  in  $Fe(CN_5)_3 \cdot 3H_2O$
- (a) 45 (b) 30 (c) 19 (d) 25
47. What weight of  $SO_2$  can be made by burning sulphur in 5.0 moles of oxygen
- (a) 640 grams (b) 160 grams (c) 80 grams (d) 320 grams
48. What is the normality of a 1 M solution of  $H_3PO_4$
- (a) 0.5 N (b) 1.0 N (c) 2.0 N (d) 3.0 N
49. Normality of 2M sulphuric acid is
- (a) 2N (b) 4N (c)  $\frac{N}{2}$  (d)  $\frac{N}{4}$
50. In order to prepare one litre normal solution of  $KMnO_4$ , how many grams of  $KMnO_4$  are required if the solution is used in acidic medium for oxidation
- (a) 158 g (b) 31.6 g (c) 790 g (d) 62 g