

## Practice Paper

Time : 2 Hour

11th standard (JEE BASED)

Total Marks : 200

### SOME BASIC CONCEPTS OF CHEMISTRY

#### Chemistry

#### \* SECTION - A

[160]

- Calculate the reported result and number of significant figure of  $(41.6325 - 41.612)$   
(A) 0.0205,4 (B) 0.020,3 (C) 0.020,2 (D) 0.0205,3
- The prefix  $10^{18}$  is  
(A) Giga (B) Nano (C) Mega (D) Exa
- The unit of the van der Waals gas equation parameter ' $a$ ' in  $\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$  is :  
(A)  $\text{kg m s}^{-2}$  (B)  $\text{dm}^3 \text{ mol}^{-1}$  (C)  $\text{kg m s}^{-1}$  (D)  $\text{atm dm}^6 \text{ mol}^{-2}$
- Which of the following have same number of significant figures?  
(A) 0.00253 (B) 1.0003 (C) 15.0 (D) 163  
Choose the correct answer from the options given below  
(A) A, B and C only (B) C and D only  
(C) A, C and D only (D) B and C only
- $ng$  of substance  $X$  reacts with  $mg$  of substance  $Y$  to form  $pg$  of substance  $R$  and  $qg$  of substance  $S$ . This reaction can be represented as,  $X + Y \rightarrow R + S$ . The relation which can be established in the amounts of the reactants and the products will be  
(A)  $n - m = p - q$  (B)  $n + m = p + q$  (C)  $n = m$  (D)  $p = q$
- How many moles of magnesium phosphate,  $Mg_3(PO_4)_2$  will contain 0.25 mole of oxygen atoms ?  
(A)  $1.25 \times 10^{-2}$  (B)  $2.5 \times 10^{-2}$  (C) 0.02 (D)  $3.125 \times 10^{-2}$
- Which is heaviest  
(A) 25 gm of mercury (B) 2 moles of water  
(C) 2 moles of carbon dioxide (D) 4 gm atoms of oxygen

8. The number of hydrogen atoms in 0.9 g glucose ( $C_6H_{12}O_6$ ) ( $M_w = 180 \text{ g/mol}$ ) is same as
- (A) Hydrogen atoms in 0.032 g hydrazine,  $N_2H_4$  ( $M_w = 32 \text{ g/mol}$ )
- (B) Hydrogen atoms in 0.17 g ammonia ( $NH_3$ )
- (C) Hydrogen atoms in 0.30 g ethane ( $C_2H_6$ ) ( $M_w = 30 \text{ g/mol}$ )
- (D) Hydrogen atoms in 0.03 g hydrogen, ( $H_2$ )
9. The number of atoms in 0.004 g of magnesium are
- (A)  $4 \times 10^{20}$  (B)  $8 \times 10^{20}$  (C)  $10^{20}$  (D)  $6.02 \times 10^{20}$
10. 10 gms . each of  $CO_2$  ,  $NH_3$  and  $O_2$  were taken in three separate flasks. What is the correct decreasing order of atoms
- (A)  $CO_2$  ,  $NH_3$  ,  $O_2$  (B)  $NH_3$  ,  $O_2$  ,  $CO_2$
- (C)  $O_2$  ,  $NH_3$  ,  $CO_2$  (D)  $NH_3$  ,  $CO_2$  ,  $O_2$
11. How many protons are present in 1.8 g  $NH_4^+$  .....  $N_A$
- (A) 1 (B) 1.2 (C) 1.1 (D) 11
12. 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)  $12.15 \times 10^{-3}$
13. 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
14. The molecular weight of a gas is 45. Its density at STP is
- (A) 22.4 (B) 11.2 (C) 5.7 (D) 2
15. One gram metal  $M^{+3}$  was discharged by the passage of  $1.81 \times 10^{23}$  electrons. What is the atomic weight of metal
- (A) 33.35 (B) 133.4 (C) 66.7 (D) none of these
16. The equivalent mass of a metal is 29.73 and the vapour density of its chloride is 130.4. Find out the atomic mass of the metal
- (A) 92.42 (B) 80.54 (C) 150.43 (D) 118.92
17. Atomic weight of an element is  $x$ . The actual mass of one atom of that element is
- (A)  $x \text{ gram}$
- (B)  $x \text{ amu}$
- (C)  $x \times 6.023 \times 10^{23} \text{ amu}$
- (D)  $\frac{x}{6.023 \times 10^{23}} \text{ amu}$
18.  $N_2H_4 + IO_3^- + 2H^+ + Cl^- \rightarrow ICl + N_2 + 3H_2O$

- The equivalent masses of  $N_2H_4$  and  $KIO_3$  respectively are
- (A) 8 and 35.6 (B) 8 and 87  
(C) 8 and 53.5 (D) 16 and 53.5
19. 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 ..... g
- (A) 43 (B) 86 (C) 129 (D) 172
20. An organic compound has 42.1% carbon, 6.4% hydrogen and remainder is oxygen. If its molecular weight is 342, then its molecular formula is:
- (A)  $C_{11}H_{18}O_{12}$  (B)  $C_{12}H_{20}O_{12}$   
(C)  $C_{14}H_{20}O_{10}$  (D)  $C_{12}H_{22}O_{11}$
21. An organic compound contains 78% (by wt.) carbon and remaining percentage of hydrogen. The right option for the empirical formula of this compound is :  
[Atomic wt. of C is 12, H is 1]
- (A) CH (B)  $CH_2$   
(C)  $CH_3$  (D)  $CH_4$
22. 1.5 mol of  $O_2$  combine with Mg to form oxide  $MgO$ . The mass of Mg (at. mass 24) that has combined is .....g
- (A) 72 (B) 36 (C) 48 (D) 24
23. 100 g  $CaCO_3$  reacts with 1 litre 1 N HCl. On completion of reaction how much weight of  $CO_2$  will be obtained ..... g
- (A) 5.5 (B) 11 (C) 22 (D) 33
24. Equivalent weight of  $KMnO_4$  acting as an oxidant in acidic medium is equal to
- (A) Molecular weight of  $KMnO_4$   
(B)  $\frac{1}{2} \times$  Molecular weight of  $KMnO_4$   
(C)  $\frac{1}{3} \times$  Molecular weight of  $KMnO_4$   
(D)  $\frac{1}{5} \times$  Molecular weight of  $KMnO_4$
25. When a hydrocarbon A undergoes complete combustion it requires 11 equivalents of oxygen and produces 4 equivalents of water. What is the molecular formula of A ?
- (A)  $C_9H_8$  (B)  $C_{11}H_4$  (C)  $C_5H_8$  (D)  $C_{11}H_8$
26. In the given reaction,  $X + Y + 3Z \rightleftharpoons XYZ_3$   
if one mole of each of X and Y with 0.05 mol of Z gives compound  $XYZ_3$ . (Given : Atomic masses of X, Y and Z are 10, 20 and 30 amu, respectively). The yield of  $XYZ_3$  is .....g. (Nearest integer)
- (A) 1 (B) 3 (C) 0 (D) 2

27. A sample of  $4.5\text{ mg}$  of an unknown monohydric alcohol,  $R-OH$  was added to methylmagnesium iodide. A gas is evolved and is collected and its volume measured to be  $3.1\text{ mL}$ . The molecular weight of the unknown alcohol is  $g/mol$ . [Nearest integer]  
 (A) 33 (B) 32 (C) 31 (D) 30
28. What will be the volume of  $CO_2$  at  $NTP$  obtained on heating  $10\text{ grams}$  of (90% pure) limestone  
 (A)  $22.4\text{ litre}$  (B)  $2.016\text{ litre}$  (C)  $2.24\text{ litre}$  (D)  $20.16\text{ litre}$
29. At  $STP$ , for complete combustion of  $3\text{ g } C_2H_6$  the required volume of  $O_2$  will be -  
 ..... litre  
 (A) 78.4 (B) 7.84 (C) 2.78 (D) 6.23
30. In the preceding question, the amount of  $Na_2CO_3$  present in the solution is ..... g  
 (A) 2.650 (B) 1.060 (C) 0.530 (D) 0.265
31. If  $1\text{ mole}$  of  $H_3PO_x$  is completely neutralized by  $80\text{ gm}$  of  $NaOH$ , select the correct statement :-  
 (A)  $x = 2$  and acid is monobasic (B)  $x = 3$  and acid is dibasic  
 (C)  $x = 4$  and acid is tribasic (D) All are correct
32. The mole fraction of urea in an aqueous urea solution containing  $900\text{ g}$  of water is  $0.05$ . If the density of the solution is  $1.2\text{ g cm}^{-3}$ , the molarity of urea solution is. . . . (Given data : Molar masses of urea and water are  $60\text{ g mol}^{-1}$  and  $18\text{ g mol}^{-1}$ , respectively)  
 (A) 2.50 (B) 2.55 (C) 2.60 (D) 2.98
33. The volume of  $0.1\text{ N}$  dibasic acid sufficient to neutralize  $1\text{ g}$  of a base that furnishes  $0.04\text{ mole}$  of  $OH^-$  in aqueous solution is ..... mL  
 (A) 400 (B) 600 (C) 200 (D) 800
34. Excess of  $NaOH(aq)$  was added to  $100\text{ mL}$  of  $FeCl_3(aq)$  resulting into  $2.14\text{ g}$  of  $Fe(OH)_3$ . The molarity of  $FeCl_3(aq)$  is (Given molar mass of  $Fe = 56\text{ g mol}^{-1}$  and molar mass of ..... M ( $Cl = 35.5\text{ g mol}^{-1}$ )  
 (A) 0.2 (B) 0.3 (C) 0.6 (D) 1.8
35. A solution of sodium sulphate contains  $92\text{ g}$  of  $Na^+$  ions per kilogram of water. The Molality of  $Na^+$  ions in that solution in  $\text{mol kg}^{-1}$  is  
 (A) 12 (B) 4 (C) 8 (D) 16
36. A  $20.0\text{ mL}$  solution containing  $0.2\text{ g}$  impure  $H_2O_2$  reacts completely with  $0.316\text{ g}$  of  $KMnO_4$  in acid solution. The purity of  $H_2O_2$  (in %) is..... (mol. wt. of  $H_2O_2 = 34$ ; mol. wt. of  $KMnO_4 = 158$ )

(A) 90

(B) 95

(C) 85

(D) 80

37.  $4.5\text{ g}$  of compound  $A$  ( $MW = 90$ ) was used to make  $250\text{ mL}$  of its aqueous solution. The molarity of the solution in  $M$  is  $x \times 10^{-1}$ . The value of  $x$  is ..... (Rounded off to the nearest integer)

(A) 1

(B) 2

(C) 3

(D) 4

38. Molarity ( $M$ ) of an aqueous solution containing  $x\text{ g}$  of anhyd.  $\text{CuSO}_4$  in  $500\text{ mL}$  solution at  $32^\circ\text{C}$  is  $2 \times 10^{-1}\text{ M}$ . Its molality will be. . . . .  $\times 10^{-3}\text{ m}$  (nearest integer). [Given density of the solution =  $1.25\text{ g/mL}$ .]

(A) 160

(B) 164

(C) 167

(D) 168

39. What volume of  $\text{NH}_3$  gas at  $STP$  would be needed to prepare  $100\text{ mL}$  of  $2.5$  molal ( $2.5\text{ m}$ ) ammonium hydroxide solution ..... litres

(A) 0.056

(B) 0.56

(C) 5.6

(D) 11.2

40.  $\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$  ; In this chemical reaction what will be the amount of calcium chloride when  $10\text{ g}$  calcium carbonate and  $400\text{ mL}$   $0.25\text{ M HCl}$  is used ..... g

(A) 4.05

(B) 5.55

(C) 11.1

(D) 16.65

#### \* SECTION - B

[40]

41. The normality of  $4\%$  ( $w/V$ )  $\text{NaOH}$  is

42.  $1.25\text{ g}$  of a solid dibasic acid is completely neutralised by  $25\text{ mL}$  of  $0.25$  molar  $\text{Ba(OH)}_2$  solution. Molecular mass of the acid is

43. The mole fraction of a solute in a  $100$  molal aqueous solution .....  $\times 10^{-2}$  (Round off to the Nearest Integer).

[Given : Atomic masses :  $H : 1.0\text{ u}, O : 16.0\text{ u}$ ]

44. The number of atoms in  $8\text{ g}$  of sodium is  $x \times 10^{23}$ . The value of  $x$  is ..... (Nearest integer)

[ Given :  $N_A = 6.02 \times 10^{23}\text{ mol}^{-1}$ , Atomic mass of  $\text{Na} = 23.0\text{ u}$ ]

45. The volume (in  $\text{mL}$  ) of  $0.1\text{ N NaOH}$  required to neutralise  $10\text{ mL}$  of  $0.1\text{ N}$  phosphinic acid is.....

46. How much water should be added to  $200\text{ c.c}$  of semi normal solution of  $\text{NaOH}$  to make it exactly deci normal ..... cc

47. What volume of oxygen gas ( $\text{O}_2$ ) measured at  $0^\circ\text{C}$  and  $1\text{ atm}$ , is needed to burn completely  $1\text{ L}$  of propane gas ( $\text{C}_3\text{H}_8$ ) measured under the same conditions? ..... L

48. Sulphur forms the chlorides  $\text{S}_2\text{Cl}_2$  and  $\text{SCl}_2$ . The equivalent mass of sulphur in  $\text{SCl}_2$  is..... $\text{g/mol}$

49. How many  $g$  of a dibasic acid (Mol. wt. = 200) should be present in  $100\text{ ml}$  of its aqueous solution to give decinormal strength .....  $g$
50. The ratio of number of oxygen atoms ( $O$ ) in  $16.0\text{ g}$  ozone ( $O_3$ ),  $28.0\text{ g}$  carbon monoxide ( $CO$ ) and  $16.0$  oxygen ( $O_2$ ) is (Atomic mass :  $C = 12, O = 16$  and Avogadro's constant  $N_A = 6.0 \times 10^{23}\text{ mol}^{-1}$  )
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