

NEET ANSWER KEY & SOLUTIONS

SUBJECT :- CHEMISTRY

CLASS :- 11th

CHAPTER :- MOLE CONCEPT

PAPER CODE :- CWT-1

ANSWER KEY											
1.	(A)	2.	(C)	3.	(B)	4.	(B)	5.	(A)	6.	(A)
8.	(B)	9.	(D)	10.	(A)	11.	(A)	12.	(C)	13.	(B)
15.	(B)	16.	(A)	17.	(C)	18.	(B)	19.	(B)	20.	(A)
22.	(B)	23.	(A)	24.	(B)	25.	(C)	26.	(B)	27.	(D)
29.	(A)	30.	(A)	31.	(A)	32.	(A)	33.	(A)	34.	(A)
36.	(D)	37.	(C)	38.	(C)	39.	(A)	40.	(B)	41.	(B)
43.	(A)	44.	(D)	45.	(C)	46.	(A)	47.	(C)	48.	(B)
50.	(A)										49. (A)

SOLUTIONS

SECTION-A											
1.	(A)							8.	(B)		
Sol.	This is the required relation in Centigrade and Fahrenheit scales.							Sol.	molecule of $\text{H}_2\text{SO}_4 = \frac{196}{98} = 2$.		
2.	(C)							Sol.	Hence : H = 4 atoms, S = 2 atoms, O = 8 atoms.		
Sol.	Theory based							Sol.	1 mole $\text{P}_4 = N$ molecules of $\text{P}_4 = 4 N$ atoms of P_4 .		
3.	(B)							Sol.	(1) moles of C = 24/12 = 2, So no. of atoms = $2N_A$		
Sol.	Molecular weight of $\text{SO}_2 = 32 + 16 \times 2 = 64$ amu							Sol.	(2) moles of Fe = 56/56 = 1, So no. of atoms = N_A		
4.	(B)							Sol.	(3) moles of Al = 27/27 = 1, So no. of atoms = N_A		
Sol.	$\text{mole} = \frac{\text{mass}}{\text{at. wt.}} = \frac{46}{23} = 2 \text{ mole.}$							Sol.	(4) moles of Fe = 108/108 = 1, So no. of atoms = N_A		
5.	(A)							Sol.	11. (A)		
Sol.	We know that, $1 \text{ amu} = \frac{1}{12} \times \text{weight of one } {}^{12}\text{C atom}$ or weight of one ${}^{12}\text{C}$ atom = 12 amu (at. wt. of C = 12 amu). Similarly, as the atomic weight of He is 4 amu, weight of one He atom = 4 amu. Thus, the number of atoms in 100 amu of He = $\frac{100}{4} = 25$.							Sol.	12 g ${}_6\text{C}^{12}$ contains $6N_A$ electrons and $6 N_A$ neutrons.		
6.	(A)							Sol.	12. (C)		
Sol.	In 18 g, no. of molecules = N_A							Sol.	Mole of Aluminium = $\frac{54}{27} = 2 \text{ mole.}$		
	so in 0.09 g no. of molecules = $\frac{N_A}{18} \times 0.09$							Sol.	Al and Mg have same number of atoms (given). Hence same moles also.		
	= $\frac{N_A}{2 \times 100} = 3.01 \times 10^{21}$.								. ∴ Mass of magnesium = $2 \times 24 = 48 \text{ g.}$		
7.	(B)							Sol.	13. (B)		
Sol.	$\text{mole} = \frac{w}{m} = \frac{1}{m}$							Sol.	$\frac{1}{2} \times 6.023 \times 10^{23} = 3.0125 \times 10^{23}$		
	for largest no. of molecule m should be lowest.							Sol.	14. (D)		
								Sol.	$9.108 \times 10^{-31} \text{ kg is the wt. of } 1 e^- = \text{moles of } e^-$ So 1 kg is the wt. of $1 e^-$		
									= $\frac{1}{9.108 \times 10^{-31}} \times \frac{1}{N_A}$		
									= $\frac{1}{9.108 \times 10^{-31} \times 6.023 \times 10^{23}}$		
									= $\frac{10^8}{9.108 \times 6.023}$.		

<p>15. (B)</p> <p>Sol. Mol. wt. of gas is $= \frac{16 \times 22.4}{5.6} = 64$ g $32 + 16x = 64$ $x = 2$</p>	<p>24. (B)</p> <p>Sol. 1000 mL solution contain 2 mole of ethanol or 1000×1.025 g solution contain 2 mole of ethanol wt. of solvent $= 1000 \times 1.025 - 2 \times 46$ $m = \frac{2}{1000 \times 1.025 - 2 \times 46} \times 1000$ $m = \frac{2}{933} \times 1000 = 2.143$</p>
<p>16. (A)</p> <p>Sol. Number of electrons $= \frac{1.8 \times 10}{18} \times N_A$</p>	<p>25. (C)</p> <p>Sol. $M_1 V_1 + M_2 V_2 = M_R [V_1 + V_2]$ $1 \times 500 + 3 \times 500 = M_R [500 + 500]$ $M_R = 1$</p>
<p>17. (C)</p> <p>Sol. $2 Al + \frac{3}{2} O_2 \longrightarrow Al_2O_3$ \Rightarrow weight of Al required $= 2 \times 27 = 54$ g</p>	<p>26. (B)</p> <p>Sol. Weight of NaOH = 20 gram Weight of solvent = 80 g $M = \frac{20 \times 1000}{40 \times 80} = 6.25$ m</p>
<p>18. (B)</p> <p>Sol. $KClO_3 \rightarrow KCl + \frac{3}{2} O_2$ $\frac{3}{2}$ mole or 33.6 litre O_2 from 1 mole $KClO_3$ 11.2 litre of O_2 formed by $\frac{1}{3}$ mole $KClO_3$</p>	<p>27. (D)</p> <p>Sol. $2(+1) + 2x = 0$ $\therefore x = -1$</p>
<p>19. (B)</p> <p>Sol. By applying POAC for C atoms moles of ethylene $\times 2$ = mole of polythene $\times n \times 2$ $\frac{100g}{28} \times 2 = \frac{\text{wt. of polythene}}{28 \times n} \times n \times 2$ wt. of polythene = 100 g</p>	<p>28. (B)</p> <p>Sol. $SO_3^{2-} \Rightarrow 1(x) + 3(-2) = -2 \therefore x = +4$ $S_2O_4^{2-} \Rightarrow 2(x) + 4(-2) = -2 \therefore x = +3$ $S_2O_6^{2-} \Rightarrow 2(x) + 6(-2) = -2 \therefore x = +5$</p>
<p>20. (A)</p> <p>Sol. $Zn + Fe + 2S \longrightarrow Zn(FeS_2)$ initial mole 2 3 5 0 final mole 0 3-2 5-4 2 = 1 = 1 $Zn + Fe + 2S \longrightarrow Zn(FeS_2)$</p>	<p>29. (A)</p> <p>Sol. $NaN_3 \Rightarrow 1(+1) + 3(x) = 0 \therefore x = -1/3$ $N_2H_2 \Rightarrow 2(x) + 2(+1) = 0 \therefore x = -1$ $NO \Rightarrow 1(x) + 1(-2) = 0 \therefore x = +2$ $N_2O_5 \Rightarrow 2(x) + 5(-2) = 0 \therefore x = +5$</p>
<p>21. (B)</p> <p>Sol. Molarity $= \frac{6.02 \times 10^{22}}{6.02 \times 10^{23}} \times \frac{1}{1/2} = 0.2$</p>	<p>30. (A)</p> <p>Sol. 10 mole NH_3 have mole of 'H' atom $= 10 \times 3$ 5 mole of H_2SO_4 have mole of 'H' atom $= 10$ Total mole of 'H' atom $= 40$ mole of $H_2 = 20$ Hence : number of H_2 molecules $= 20N_A$</p>
<p>22. (B)</p> <p>Sol. Mole $= M \times V$ $100 \times 10^{-3} = 0.8 \times V$ $V = 0.125$</p>	<p>31. (A)</p> <p>Sol. 1 litre Hg metal volume = 1000 $d = \frac{m}{v}$ mass $= d \times V = 13.6 \times 1000$ No of mole of Hg metal $= \frac{13.6 \times 1000}{200} = 68$ mole</p>
<p>23. (A)</p> <p>Sol. Molarity has volume term in its expression and volume is temperature dependent.</p>	

32.	(A)
Sol.	C H O
mass	24 8 32
moles	$\frac{24}{12}$ 1 $\frac{32}{16}$
ratio	2 8 2
Simple integer ratio	1 4 1
Hence empirical formula is	CH_4O

33.	(A)
Sol.	$\text{I}_2 + 2\text{Cl}_2 \longrightarrow \text{ICl} + \text{ICl}_3$
	Given mass 25.4 gram 14.2 gram 0 0
	initial mole 0.1 mole 0.2 mole 0 0
	final mole 0 0 0.1 0.1

34.	(A)
Sol.	$2\text{SO}_2 + \text{O}_2 \longrightarrow 2\text{SO}_3$
	Initial mole 10 15 0
	Final mole $(10 - 2x)$ $(15 - x)$ $2x$
	\therefore Given $2x = 8$
	$\therefore x = 4$
	$\therefore \text{Mole of SO}_2 \text{ left} = 10 - 2 \times 4 = 2$
	$\text{Mole of O}_2 \text{ left} = 15 - 4 = 11$

35.	(A)
Sol.	$\text{H}_2\text{SO}_4 + \text{Ca}(\text{OH})_2 \longrightarrow \text{CaSO}_4 + 2\text{H}_2\text{O}$
	Initial mole 0.5 0.2 0 0
	finally mole 0.5 - 0.2 0 0.2 0.4

SECTION-B

36.	(D)
Sol.	500 gm toothpaste contains 0.4 g fluoride
	$\therefore 10^6 \text{ g toothpaste will contain } \frac{0.4}{500} \times 10^6$
	= 800 g fluoride
	$\therefore \text{ppm of fluoride} = 800$

37.	(C)
Sol.	$M_{\text{final}} = \frac{M_1 V_1 + M_2 V_2}{V_1 + V_2 + V_{\text{water}}} ; 0.25$
	$= \frac{0.6 \times 250 + 0.2 \times 750}{250 + 750 + V_{\text{water}}} ; \text{ So}$
	$V_{\text{water}} = 200 \text{ ml.}$

38.	(C)
Sol.	Moles of HNO_3 required = $\frac{0.784}{108} = 0.0072$
	$\times \frac{4}{3} = 0.00968.$
	$\text{Vol. of HNO}_3 = \frac{0.00963}{1.15} \times 1000 = 8.41 \text{ ml.}$

39.	(A)
Sol.	Molarity = $\frac{10 \times 1.8 \times 98}{98} = 18 \text{ M}$

40.	(B)
Sol.	Fe_3O_4 can be written as $\text{FeO} \cdot \text{Fe}_2\text{O}_3$. In FeO , Fe has oxidation state + 2, in Fe_2O_3 has oxidation state + 3. resultant oxidation number = $\frac{1 \times 2 + 2 \times 3}{3}$ $= \frac{8}{3}$.

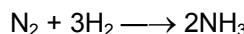
41.	(B)															
Sol.	Data:-															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Element</th> <th>Abundance</th> <th>Atomic Mass</th> </tr> </thead> <tbody> <tr> <td>X^{200}</td> <td>90%</td> <td>200</td> </tr> <tr> <td>X^{199}</td> <td>8.0%</td> <td>199</td> </tr> <tr> <td>X^{202}</td> <td>2.0%</td> <td>202</td> </tr> </tbody> </table>				Element	Abundance	Atomic Mass	X^{200}	90%	200	X^{199}	8.0%	199	X^{202}	2.0%	202
Element	Abundance	Atomic Mass														
X^{200}	90%	200														
X^{199}	8.0%	199														
X^{202}	2.0%	202														

Formula:-
 Average atomic mass = [Atomic mass of X^{200} \times abundance +
 Atomic mass of X^{199} \times abundance +
 Atomic mass of X^{202} \times abundance]/100
 $= \frac{200 \times 90 + 199 \times 8 + 202 \times 2}{100}$
 $= \frac{18000 + 1592 + 404}{100}$
 $= 199.96 \approx 200 \text{ u}$

42.	(B)
Sol.	For XY_2 $n = \frac{w}{M}$
	$0.1 = \frac{10}{X + 2Y}$
	$X + 2Y = 100 \quad \dots\dots(1)$
	For X_3Y_2 $n = \frac{w}{M}$
	$0.05 = \frac{9}{3X + 2Y}$
	$3X + 2Y = 180 \quad \dots\dots(2)$
	From (1) and (2) $2X = 80$ $X = 40$ and $2Y = 100 - 40$ $= 60$ $= Y = 30$

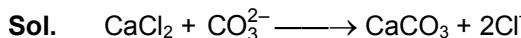
43.	(A)
Sol.	(i) 10^{-3} mole water = 6.02×10^{20} molecule H_2O (ii) 18 ml H_2O = 18 gram = 1 mole $= 6.02 \times 10^{23}$ molecule (iii) At 1 atm & 273 K $\text{No. of mole of H}_2\text{O} = \frac{0.00224}{22.4} = \frac{22.4 \times 10^{-4}}{22.4}$ $= 10^{-4}$ mole = 6.02×10^{19} molecule. (iv) 0.18 gram H_2O = 0.1 mole = 6.02×10^{22} molecule.

- 44.** (D)
Sol. Formation of ammonia

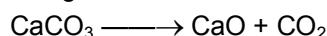


2 mole of NH_3 is formed by 3 mole of H_2
 20 mole of NH_3 is formed by 30 mole of H_2

- 45.** (C)



111 g 100g



100g 56 g

\therefore 56 g CaO is obtained by the decomposition of $CaCO_3$
 $= 100$ g

\therefore 0.959 g CaO will be obtained by the decomposition of $CaCO_3$

$$= \frac{100 \times 0.959}{56} = 1.71g$$

Further, 100 g $CaCO_3$ = 111 g $CaCO_2$

$$171 \text{ g } CaCO_3 = \frac{111 \times 171}{100} = 189 \text{ g } CaCl_2$$

Percentage of $CaCl_2$ in the mixture

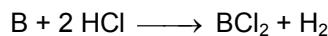
$$= \frac{189}{4.22} \times 100$$

$$= 44.78 = 45\%$$

- 46.** (A)



$$\text{mole} = \frac{x}{15} \qquad \qquad \qquad \frac{x}{15}$$



$$\text{mole} = \frac{2-x}{30} \qquad \qquad \qquad \frac{2-x}{30}$$

$$\text{Mole of } H_2 = \frac{x}{15} + \frac{2-x}{30} = \frac{2.24}{22.4} = \frac{1}{10}$$

$$\frac{x}{15} - \frac{x}{30} = \frac{1}{10} - \frac{1}{15}$$

$$x = 1 \text{ gm}$$

- 47.** (C)

$$\text{Sol. } X_{\text{ethyl alcohol}} = \frac{5.2}{5.2 + \frac{1000}{18}} = 0.086$$

- 48.** (B)

$$\text{Sol. } \frac{n_{O_2}}{n_{N_2}} = \frac{\left(\frac{m_{O_2}}{M_{O_2}} \right)}{\left(\frac{m_{N_2}}{M_{N_2}} \right)} = \left(\frac{m_{O_2}}{m_{N_2}} \right) \frac{28}{32} = \frac{1}{4} \times \frac{28}{32} = \frac{7}{32}$$

- 49.** (A)

Sol. Theory based

- 50.** (A)

Sol. One mole is the amount of a substance that contains as many particles as there are atoms in exactly 12 g of the carbon atom. So S.I. the system took mole as the seventh base fundamental quantity (symbol = mol)

