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Exercise-1

E

Section	on (A) : Units, Ato mass, Gram mole	ms, Molecules, Ate cular mass, RAM, A	omic mass, Molec verage atomic	ular mass, Gram atomic		
1.	Torr is unit of : (1) Temperature	(2) Pressure	(3) Volume	(4) Density		
2.	Centigrade and Fahrer (1) $\frac{C}{5} = \frac{F - 32}{9}$	wheit scales are related a (2) $\frac{C}{9} = \frac{F - 32}{5}$	s: (3) $\frac{C}{8} = \frac{F - 32}{5}$	(4) None of these		
3.	Which the following is (1) 0.76 cm of Hg	not equal to 10 ⁻² atm : (2) 7.6 torr	(3) 0.076 dm of Hg	(4) 0.0076 torr		
4.	 Which is not a basic postulate of Dalton's atomic theory ? (1) Atoms are neither created nor destroyed in a chemical reaction. (2) Different elements have different types of atoms. (3) Atoms of an element may be different due to presence of isotopes. (4) Each element is composed of extermely small particles called atoms. 					
5.	The modern atomic we (1) ¹² C	eight scale is based on : (2) ¹⁶ O	(3) ¹ H	(4) ¹⁸ O		
6.	1 amu is equal to (1) $\frac{1}{12}$ of C - 12	(2) $\frac{1}{14}$ of O - 16	(3) 1 g of H ₂	(4) 1.66 × 10 ⁻²³ kg		
7.	Avogadro number is : (1) Number of atoms in one gram of the element (2) Number of mililitre which one mole of a gaseous substance occupies at NTP (1 atm & 0°C) (3) Number of molecules present in one gram molecular mass of a substance. (4) All are correct					
8.	If we consider that 1/6, in place of 1/12 mass of carbon atom is taken to be the relative atomic mass unit, the mass of one mole of a substance will : (1) decrease twice (2) increase two fold (3) remain unchanged (4) be a function of the molecular mass of the substance					
Section	on (B) : Relation be	tween Mole, Mass a	nd Gaseous volum	е.		
1.	If the atomic mass of S (1) 1	Sodium is 23, the number (2) 2	of moles in 46 g of sodiu (3) 2.3	um is : (4) 4.6		
2.	Which of the following (1) 0.5 mole of H_2	would contain 1 mole of (2) 2 g of H-atoms	oarticles? (3) 16 g of O-18	(4) 16 g of methane		

3.	How many atoms are t (1) 25	here in 100 amu of He ? (2) 50	(3) 75	(4) 100	
4.	Number of molecules $(1) 3.01 \times 10^{21}$	of water in a drop of wate (2) 6.02 × 10 ²¹	r weighing 0.09 g are : (3) 3.01 × 10 ²²	(4) 3.01 × 10 ²⁰	
5.	The largest number of (1) CO_2	molecules is present in 1 (2) H ₂ O	g of (3) C ₂ H ₅ OH	(4) N ₂ O ₅ .	
6.	The total number of g-ı (1) 0.1	molecules of SO ₂ Cl ₂ in 1 (2) 0.2	3.5 g of sulphuryl chlorid (3) 0.3	e is (4) 0.4	
7.	The number of sodium (1) 12 × 23	atoms in 2 moles of sod (2) 26×10^{23}	ium ferrocyanide (Na ₄ [Fe (3) 34 × 10 ²³	e(CN) ₆]) is : (4) 48 × 10 ²³	
8.	Total number of atoms (1) 14 N _A	s in 196 amu H ₂ SO ₄ are : (2) 14	(3) 7 N _A	(4) 7	
9.	The number of molecu (1) 6.0×10^{23}	les of CO_2 present in 44 (2) 3×10^{23}	g of CO ₂ is : (3) 12×10 ²³	(4) 3×10 ¹⁰	
10.	The number of mole of (1) 0.425	ammonia in 4.25 g of an (2) 0.25	nmonia is : (3) 0.236	(4) 0.2125	
11.	One mole of P_4 molecu (1) 1 molecule	iles contain :	(2) 4 molecules		
	(3) $\frac{1}{4} \times 6.022 \times 10^{23}$ at	oms	(4) 24.088 × 10 ²³ atom	S	
12.	Number of atoms in 56 (1) Twice that in 70 g N	0 g of Fe (atomic mass 5 I (2) Half that in 20 g H	56 gmol ^{_1}) is : (3) Both (1) and (2)	(4) None of these	
13.	Which has maximum n (1) 24 g of C (12)	umber of atoms : (2) 56 g of Fe (56)	(3) 27 g of Al (27)	(4) 108 g Ag (108)	
14.	The total number of pro (1) 1.084 × 10 ²⁵	otons, electrons and neu (2) 6.022 × 10 ²³	trons in 12 g of ${}_{6}^{12}$ C is : (3) 6.022×10 ²²	(4) 18	
15.	1.0 g of hydrogen cont atoms in 1 g of He is :	ains 6×10 ²³ atoms. The a	atomic weight of helium is	s 4. It follows that the number of	
	(1) $\frac{1}{4} \times 6 \times 10^{23}$	(2) $4 \times 6 \times 10^{23}$	(3) 6 × 10 ²³	(4) 12 × 10 ²³	
16.	A sample of aluminiun atoms? (At. wt. Al = 27	n has a mass of 54.0 g. , Mg = 24)	What is the mass of th	ne same number of magnesium	
	(1) 12 g	(2) 24 g	(3) 48 g	(4) 96 g.	
17.	The number of atoms in 558.5 g of Fe (at wt.= 5 (1) Twice that in 60 g carbon (3) Half in 8 g He		5.85) is : (2) 6.022 × 10 ²² (4) 558.5 × 6.023 × 10 ²³		

18.	The total number of elements $(1) 4.8 \times 10^{24}$	ctrons present in 8.0 g of (2) 3.01 × 10 ²⁴	methane is (3) 4.8 × 10 ²⁵	(4) 3.01 × 10 ²³ .			
19.	The weight of 1×10^{22} m	eight of 1×10^{22} molecules of CuSO ₄ . 5H ₂ O is :					
	(1) 41.59 g	(2) 415.9 g	(3) 4.159 g	(4) None of these			
20.	How many moles of ele	ctron weigh one kilogram	ו :				
	(1) 6.023 × 10 ²³	(2) $\frac{1}{9.108} \times 10^{31}$	(3) $\frac{6.023}{9.108} \times 10^{54}$	(4) $\frac{1}{9.108 \times 6.023} \times 10^8$			
21.	Under the same condition (1) be noble gases (3) have a volume of 22	ons, two gases have the 2.4 dm³ each	same number of molecu (2) have equal volumes (4) have an equal numb	les. They must ber of atoms			
22.	5.6 litre of oxygen at ST (1) 6.02 × 10 ²³ atoms	P contains : (2) 3.01 × 10 ²³ atoms	(3) 1.505 × 10 ²³ atoms	(4) 0.7525 × 10 ²³ atoms			
23.	If V mI of the vapours of	f substance at NTP weig	ht W g. Then molecular v	weight of substance is :			
	(1) (W/V) × 22400	(2) $\frac{V}{W} \times 22.4$	(3) (W–V) × 22400	$(4) \ \frac{W \times 1}{V \times 22400}$			
24.	If 1 dm³ of a gas weight (1) 56 g	s 2.5 g at STP, its gram- (2) 11.2 g	molecular weight is : (3) 22.4 g	(4) 224 g			
25.	16 g of an ideal gas SO (1) x = 3	_x occupies 5.6 L. at STP (2) x = 2	. The value of x is (3) x = 4	(4) none of these			
Sectio	on (C) : Density and	Vapour density					
1.	Vapour density of a gas (1) 0.178	s if its density is 0.178 g/L (2) 2	_ at NTP is : (3) 4	(4) 0.089			
2.	A gas is found to have t	he formula (CO),. It's VE) is 70 the value of x mus	st be :			
	(1) 7	(2) 4	(3) 5	(4) 6			
3.	Number of electrons in	1.8 mL of $H_2O(\ell)$ is abou	t :				
	(1) 6.02 × 10 ²³	(2) 3.011 × 10 ²³	(3) 0.6022 × 10 ²¹	(4) 60.22 × 10 ²⁰			
Sectio	Section (D) : Percentage composition and Molecular formula						
1.	The percentage value of (1) 46	of nitrogen in urea is abou (2) 85	ut (3) 18	(4) 28			
2.	A hydrocarbon contains (1) CH ₄	75% of carbon. Then its (2) C ₂ H ₄	molecular formula is : (3) C ₂ H ₆	(4) C ₂ H ₂			
3.	The empirical formula	of a compound of molec	cular mass 120 is CH ₂ O	. The molecular formula of the			
	compound is : (1) $C_2H_4O_2$	(2) C ₄ H ₈ O ₄	(3) C ₃ H ₆ O ₃	(4) all of these			

4.	The number of atoms of Cr and O in a compound are 4.8 \times 10 ¹⁰ & 9.6 \times 10 ¹⁰ respectively. Its empirica formula is–						
	(1) Cr ₂ O ₃	(2) CrO ₂	(3) Cr ₂ O ₄	(4) None			
5.	The percentages of C	, H and N in an organic ind is	compound are 40%, 13	3.3% and 46.7%. The empirical			
	(1) CH ₂ N	(2) CH ₄ N	(3) CH ₅ N	(4) $C_{3}H_{9}N_{3}$.			
6.	The simplest formula of element 'B' (Atomic we	of a compound containin eight = 20) is	g 50% of element 'A' (A	tomic weight = 10) and 50% of			
	(1) AB	(2) A ₂ B	(3) A_2B_2	(4) A_2B_3			
7.	Insulin constans 3.4% (1) 941.176	sulphur. The minimum m (2) 944	ol. wt. of insulin is – (3) 945.27	(4) None			
Section	on (E) : Balanced ch	nemical equation ar	alysis				
1.	For the reaction 2P + Q	$Q \rightarrow R$, 8 mol of P and ex	ccess of Q will produce :				
	(1) 8 mol of R	(2) 5 mol of R	(3) 4 mol of R	(4) 13 mol of R			
2.	If 1.5 moles of oxygen	combine with AI to form	AI_2O_3 , the weight of AI us	ed in the reaction is :			
	(1) 27 g	(2) 40.5 g	(3) 54g	(4) 81 g			
3.	How many moles of po	tassium chlorate need to	be heated to produce 1	1.2 litre oxygen at N.T.P.			
	(1) $\frac{1}{2}$ mol	(2) $\frac{1}{3}$ mol	(3) $\frac{1}{4}$ mol	(4) $\frac{2}{3}$ mol			
4.	What volume of CO ₂ w	ill be liberated at NTP if	12 g of carbon is burnt in	excess of oxygen ?			
	(1) 11.2 L	(2) 22.4 L	(3) 2.24 L	(4) 1.12 L			
5.	For the complete comb	oustion of 4 litre ethane, h	now much oxygen is requ	lired ?			
	(1) 14 litre	(2) 4 litre	(3) 8 litre	(4) 12 litre			
6.	The volume of oxygen (1) 40 litre	necessary for the comple (2) 60 litre	ete combusion of 20 litre (3) 80 litre	of propane is : (4) 100 litre			
7.	The equation :						
	$2AI(S) + \frac{3}{2} O_2(g) \longrightarrow AI_2O_3(S)$ show that						
	(1) 2 mole of AI reacts with $\frac{3}{2}$ mole of O ₂ to produce $\frac{7}{2}$ mole of AI ₂ O ₃						
	(2) 2g of Al reacts with	$\frac{3}{2}$ g of O ₂ to produce or	ne mole of Al_2O_3				
	(3) 2g mole of AI reacts with $\frac{3}{2}$ litre of O ₂ to produce 1 mole of AI ₂ O ₃						

(4) 2 mole of AI reacts with $\frac{3}{2}$ mole of O ₂ to produce 1 mole of AI ₂ O ₃	
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8.	The number of moles of oxygen obtained by the electrolytic decomposition of 90 g water is : $2H_2O \longrightarrow 2H_2+O_2$			on of 90 g water is :	
	(1) 2.5	(2) 5	(3) 7.5	(4) 10	
9.	Volume of CO_2 obtaine (At. wt. of Ba = 137)	d at STP by the complete	e decompoisition of 9.85	g. BaCO ₃ is –	
	(1) 2.24 lit	(2) 1.12 lit	(3) 0.84 lit	(4) 0.56 lit	
10.	The moles of O ₂ require	ed for reacting with 6.8 g	of ammonia		
	(NH ₃ + O ₂ —	→ NO + H ₂ O) is			
	(1) 5	(2) 2.5	(3) 1	(4) 0.5	
11.	At same temperature a ethene is	nd pressure the volume	of oxygen required for co	omplete combustion of 20 ml of	
	(1) 30 ml	(2) 60 ml	(3) 40 ml	(4) 50 ml	
12.	The volume of gas at N	TP produced by 100g of	CaC ₂ with water		
	$CaC_2 + H_2O \longrightarrow Ca$	$(OH)_2 + C_2H_2$			
	(1) 70 litre	(2) 35 litre	(3) 17.5 litre	(4) 22.4 litre	
13.	The weight of lime obta	ined by heating 200 kg o	f 95% pure lime stone is	:	
	(1) 98.4 kg	(2) 106.4 kg	(3) 112.8 kg	(4) 122.6 kg	
14.	20 gm. $CaCO_3$ on deco	mposition gives CO_2 at S	TP if yield of reaction is	75% only	
	(1) 3.36 litre	(2) 22.4 litre	(3) 2.24 litre	(4) None of these	
Section (F) : Principle of atomic conversation					

X g of Ag was dissolved in HNO₃ and the solution was treated with excess of NaCl. When 2.87 g of AgCl was precipeted the value of X is (1) 1.08 g (2) 2.16 g (3) 2.70 g (4) 1.62 g

2. When 100g of ethylene polymerises entirely to polyethene, the weight of polyethene formed as per the equation $n(C_2H_4) \rightarrow (-CH_2-CH_2-)_n$ is :

$$n(C_2H_4) \rightarrow (-CH_2-CH_2-)_n.$$

(1) (n/2)g (2) 100g (3) (100/n)g (4) 100ng

3. 10 g of a sample of a mixture of CaCl₂ and NaCl is treated to precipitate all the calcium as CaCO₃. This Ca CO₃ is heated to convert all the Ca to CaO and the final mass of CaO is 1.62 g. The percent by mass of CaCl₂ in the original mixture is.
 (1) 32.1 % (2) 16.2 % (3) 21.8 % (4) 11.0 %

4.	500 ml of a gaseous hydrocarbon when burnt in excess of O_2 gave 2.5 litre of CO_2 and 3.0 litre of					
	vapours under same co	onditions. Molecular form	ula of the hydrocarbon is	:		
	(1) C ₄ H ₈	(2) C ₄ H ₁₀	(3) C ₅ H ₁₀	(4) C ₅ H ₁₂		
Sectio	on (G) : Limitting rea	agent				
1.	For the reaction 2P + Q	$P \rightarrow R$, 8 mol of P and 5	mol of Q will produce			
	(1) 8 mol of R	(2) 5 mol of R	(3) 4 mol of R	(4) 13 mol of R		
2.	For the reaction : $A + 2$ 5 mole of A and 8 mole	$B \rightarrow C$ of B will produce :	(0) 0	(1) 10		
	(1) 5 mole of C	(2) 4 mole of C		(4) 12 mole of C		
3.	4 g of hydrogen is ignit	ed with 4 g of oxygen, th	e amount of water forme	d is ?		
	(1) 2.5 g	(2) 0.5 g	(3) 4.5 g	(4) 8 g		
4.	Calculate the amount o $2H_2 + O_2 \longrightarrow$	$f H_2$ which is left unreacted $2H_2O$	ed in the given reaction :			
	If 8 g of H_2 is mixed with	n 16 g O ₂ ?				
	(1) 3 g	(2) 6 g	(3) 1 g	(4) 4 g		
5.	If 30 ml of H_2 and 20 m	l of O_2 react to form wate	er, what is left at the end	of the reaction?		
	(1) 10 ml of H ₂	(2) 5 ml of H ₂	(3) 10 ml of O ₂	(4) 5 ml of O ₂		
6.	How many mole of Zn(F	FeS ₂) can be made from	2 mole zinc, 3 mole iron	and 5 mole sulphur.		
	(1) 2 mole	(2) 3 mole	(3) 4 mole	(4) 5 mole		
Sectio	on (H) : Concentratio	on terms				
1.	500 mL of a glucose so (1) 0.1 M	lution contains 90 g of gl (2) 1.0 M	ucose. The concentration (3) 0.2 M	n of the solution is (4) 2.0 M		
2.	500 mL of a glucose so (1) 0.1 M	lution contains 6.02 × 10 (2) 1.0 M	²² molecules. The conce (3) 0.2 M	ntration of the solution is (4) 2.0 M		
3.	What volume of a 0.8 M	1 solution contains 100 m	illi moles of the solute?	(4) 62 5 ml		
	(1) 100 IIIL	(2) 125 IIIL	(3) 500 IIIL	(4) 02.5 IIIL		
4.	Which of the following solutions are unimolar solutions ?(1) 4.6 g of C_2H_5OH in 10 mL of solution(2) 110.98 g of $CaCI_2$ in 1000 mL of solution(3) 0.23 g of CH_3OH in 100 mL of solution(4) 5.88 g of NaCI in 1000 mL of solution.					
5.	The amount of salt requ (1) 0.05 mole	uired to prepare 10 dm ³ c (2) 0.02 mole	f decimolar solution is : (3) 0.01 mole	(4) 1.00 mole		
6.	A solution of FeCl ₃ is $\frac{\Lambda}{3}$	$\frac{1}{0}$ its molarity for CI- ion v	will be :			
	(1) <u>M</u> 90	(2) $\frac{M}{30}$	(3) <u>M</u>	(4) $\frac{M}{5}$		

7.	11.1 g CaCl ₂ is used to prepare a 500 mL solution then molarity of Cl ⁻ in solution will be :				
	(1) 0.4 M	(2) $\frac{M}{30}$	(3) 0.1 M	(4) 0.2 M	
8.	0.01 mole of a non-elec (1) 0.1 m	trolyte is dissolved in 10 (2) 0.5 m	g of water. The molality (3) 1.0 m	of the solution is : (4) 0.18 m	
9.	The molality of a sulp 1000 gm of solvent.	ohuric acid solution is	0.2. Calculate the total	weight of the solution having	
	(1) 1000 g	(2) 1098.6 g	(3) 980.4 g	(4) 1019.6g	
10.	The mole fraction of w (1) 0.0632	rater in a solution contair (2) 0.038	ning 117 g sodium chloric (3) 0.9615	le and 900 g of water is ? (4) 1.000	
11.	Which of the following of (1) Molarity	concentration factor is af (2) Molality	fected by change in temp (3) Mole fraction	erature ? (4) Weight fraction	
Sectio	on (I) : Dilution, Mix Acid base reactior	ting of solutions, I าร	nterconversion of (concentration terms and	
1.	If 500 ml of 1 M solution solution will be :	on of glucose is mixed	with 500 mℓ of 3 M solu	tion of glucose final molarity of	
	(1) 1 M	(2) 0.5 M	(3) 2 M	(4) 1.5 M	
2.	250 ml of 0.5 M KCl i resulting solution are	s diluted with water to	500 ml of solution, the	number of chloride ions in the	
	(1) 6.02×10^{23}	(2) 7.5 × 10 ²²	(3) 1 × 10 ²⁴	(4) 3.76 × 10 ²³	
3.	300 ml of 3.0 M NaCl i resulting solution is	s added to 200 ml of 4.0	0 M BaCl ₂ solution. The	concentration of Cl [−] ions in the	
	(1) 7 M	(2) 1.6 M	(3) 1.8 M	(4) 5 M	
4.	The molarity of the solu (1) M/10	tion containing 2.8% w/\ (2) M/2	v solution of KOH is (3) M/5	(4) 1 M	
5.	The molality of the solu	tion containing 20% w/w	solution of NaOH is :		
	(1) 4.5 m	(2) 6.25 m	(3) 0.3 m	(4) 1 m	
6.	Mole fraction of A in H_2	O is 0.2. The molality of	A in H_2O is :		
	(1) 13.9	(2) 15.5	(3) 14.5	(4) 16.8	
7.	The molarity of 20% w/v (1) 2.32	w sulphuric acid of densi (2) 2.02	ity 1.14 g cm⁻³ is (3) 2.12	(4) 2.22	
8.	36.5 % w/w HCl has de (1) 15.7, 15.7	nsity equal to 1.20 g mL (2) 12, 12	^{_1} . The molarity (M) and r (3) 15.7, 12	nolality (m), respectively, are (4) 12, 15.7	
9.	An aqueous solution of e	ethanol has density 1.025 (2) 2.143	g/mL and it is 2M. What is (3) 1.951	s the molality of this solution ? (4) None of these.	

10.3.0 litre of water are added to 2.0 litre of 5 M HCI. What is the molarity of HCI (in M) the resultant solution ?
(1) 2(2) 3(3) 4(4) 5

Section (J): Oxidation number

- 1.
 The oxidation number of Oxygen in Na_2O_2 is :

 (1) + 1
 (2) + 2
 (3) 2
 (4) 1
- **2.** The oxidation number of Phosphorus in $Mg_2P_2O_7$ is : (1) + 3 (2) + 2 (3) + 5 (4) - 3
- **3.** The oxidation states of Sulphur in the anions SO_3^{2-} , $S_2O_4^{2-}$ and $S_2O_6^{2-}$ follow the order : (1) $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$ (2) $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$ (3) $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$ (4) $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$
- **4.** Match List-I (Compounds) with List-II (Oxidation states of Nitrogen) and select answer using the codes given below the lists :

	List-I				List-II					
(1)	NaN_3			(1)	+5					
(2)	N_2H_2			(2)	+2					
(3)	NO			(3)	-1/3					
(4)	N_2O_5			(4)	-1					
(Code	e):									
	(1)	(2)	(3)	(4)			(1)	(2)	(3)	(4)
(1)	3	4	2	1		(2)	4	3	2	1
(3)	3	4	1	2		(4)	4	3	1	2

5. Oxidation number of nitrogen in $(NH_4)_2SO_4$ is

	$(1) - \frac{1}{3}$	(2) – 1	(3) + 1	(4) – 3
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Section (K): Balancing of redox reaction

1. In the reaction $xHI + yHNO_3 \longrightarrow NO + I_2 + H_2O$, upon balancing with whole number coefficients : (1) x = 3, y = 2 (2) x = 2, y = 3 (3) x = 6, y = 2 (4) x = 6, y = 1

2. For the redox reaction $MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow Mn^{2+} + CO_2 + H_2O_4$, the correct whole number stoichiometric coefficients of MnO_4^- , $C_2O_4^{2-}$ and H^+ are respectively: (1) 2, 5, 16 (2) 16, 5, 2 (3) 5, 16, 2 (4) 2, 16, 5

3. For the redox reaction $xP_4 + yHNO_3 \longrightarrow H_3PO_4 + NO_2 + H_2O$, upon balancing with whole number coefficients: (1) x = 1, y = 5 (2) x = 2, y = 10 (3) x = 1, y = 20 (4) x = 1, y = 15

4. Consider the following reaction: $3Br_2 + 6CO_3^{2-} + 3H_2O \longrightarrow 5Br^- + BrO_3^- + 6 HCO_3^-$ Which of the following statements is true regarding this reaction:

- (1) Bromine is oxidized and the carbonate radical is reduced.
- (2) Bromine is reduced and the carbonate radical is oxidized.
- (3) Bromine is neither reduced nor oxidized.
- (4) Bromine is both reduced and oxidized.

Exercise-2

1.	The atmospheric press (1) 0.63	ure on Mars is 0.61 kPa. (2) 4.6	What is the pressure in ((3) 6.3	mm Hg ? (4) 3.2	
2.	At what temperature, bo (1) 100°	oth Celsius and Fahrenh (2) 130º	eit scale read the same v (3) 60º	value : (4) –40º	
3.	Which property of an el (1) Atomic weight	ement may have non-inte (2) Atomic number	egral value. (3) Mass Number	(4) Both (1) and (3)	
4.	The weight of one atom (1) 3.95×10^{-22}	n of Uranium is 238 amu. (2) 3.96 × 10 ^{–22}	Its actual weight is g (3) 2.95 × 10 ⁻²²	(4) 3.98 × 10 ^{−20}	
5.	Average atomic mass of and remaining 21 mole	of Magnesium is 24.31 ar % of ²⁵ Mg and ²⁶ Mg. Cal	mu. This magnesium is c culate mole % of ²⁶ Mg.	composed of 79 mole % of ²⁴ Mg	
	(1) 2	(2) 10	(3) 20	(4) 40	
6.	How many grams are c	ontained in 1 gram-atom	of Na ?		
	(1) 13 g	(2) 23 g	(3) 1 g	(4) $\frac{1}{23}$ g	
7.	An element has three i 5% respectively. The av	sotopes with masses 24 verage mass of the isoto	, 25 and 26 with relative permixture would be	e abundance of 80%, 15% and	
	(1) 25.25	(2) 25.50	(3) 24.50	(4) 24.25	
8.	The molar ratio of Fe ⁺⁺ ion in both ferrous and	to Fe ⁺⁺⁺ in a mixture of ferric sulphate is	$FeSO_4$ and $Fe_2(SO_4)_3$ ha	aving equal number of sulphate	
	(1) 1 : 2	(2) 3 : 2	(3) 2 : 3	(4) can't be determined	
9.	1.00 g of a pure elemer	nt contains 4.39 × 10 ²¹ at	oms. The element is		
-	(1) U	(2) Ce	(3) Ba	(4) Au.	
10.	The number of neutrons	s in 5 g of D_2O (D is) 2_1H	are :		
	(1) 2.5 N _A	(2) N _A	(3) 2 N _A	(4) 0.5 N _A	
11.	If, from 10 moles NH_3 and 5 moles of H_2SO_4 , all the H-atoms are removed in order to form H_2 gas, then find the number of H_molecules formed				
	(1) 20 N _A	(2) 10 N _A	(3) 5 N _A	(4) N _A	
12	The atomic weights of t	wo elements A and B are	2 40u and 80u respective	elv If x q of A contains v atoms	

12. The atomic weights of two elements A and B are 40u and 80u respectively. If x g of A contains y atoms, how many atoms are present in 2x g of B?

	(1) $\frac{y}{2}$	(2) $\frac{y}{4}$	(3) y	(4) 2y		
13.	Four 1-1 litre flasks are separately filled with the gases H_2 , He, O_2 and O_3 at the same temperature and pressure. The ratio of total number of atoms of these gases present in different flask would be :					
1/		(2) 1 $(2 \cdot 2 \cdot 2 \cdot 3)$	volume at STP the das			
14.	(1) N_2O	(2) CO	(3) CO_2	(4) 1 & 3 Both		
15.	The volume of a gas in the tube is :	discharge tube is 1.12 >	< 10 ⁻⁷ ml. at STP then th	ne number of molecule of gas in		
	(1) 3.01 × 10 ⁴	(2) 3.01 × 10 ¹⁵	(3) 3.01 × 10 ¹²	(4) 3.01 × 10 ¹⁶		
16.	22.4 litre of water vapor (Given : density of water	ur at NTP, when condens er = 1 a/ml)	sed to water occupies an	approximate volume of :		
	(1) 18 litre	(2) 1 litre	(3) 1 ml	(4) 18 ml		
17.	The density of liquid n	nercury is 13.6 g/cm³. H f Ha = 200)	low many moles of me	rcury are there in 1 litre of the		
	(1) 68 mole	(2) 69 mole	(3) 70 mole	(4) 71 mole		
18.	A compound of X and Molecular formula of the	Y has equal mass of th at compound (its mol wt.	em. If their atomic weigl is 120) could be :	hts are 30 and 20 respectively.		
	(1) $X_2 Y_2$	(2) X ₃ Y ₃	(3) X ₂ Y ₃	(4) $X_3 Y_2$		
19.	1 litre of a hydrocarbo formula of the hydrocar	n weights as much as o bon is –	one litre of CO ₂ at same	e P and T. Then the molecular		
	(1) C ₃ H ₈	(2) C ₂ H ₆	(3) C ₂ H ₄	(4) C ₃ H ₆		
20.	64 g of an organic com formula of the compour	pound has 24 g carbon nd is :	and 8 g hydrogen and th	ne rest is oxygen. The empirical		
	(1) CH ₄ O	(2) CH ₂ O	(3) $C_2 H_4 O$	(4) None		
21.	Cystine has a sulphur molecular weight?	content of 26.7%. If its	s molecule contains two	atoms of sulphur, what is its		
	(1) 240	(2) 24	(3) 2400	(4) 120.		
22.	Percentage of Se in pe of peroxidase anhydrou	roxidase anhydrous enz <u>y</u> is enzymes is :	yme is 0.5% by weight (a	at. wt. = 78.4) then min. mol. wt.		
	(1) 1.568 × 10 ⁴	(2) 1.568 × 10 ³	(3) 15.68	(4) 2.136 × 10 ⁴		
23.	The hydrated salt Na ₂ S its original weight. Ther	SO ₄ .nH ₂ O loses all water refore, the value n is	of crystallization on hea	ting and is reduced to 44.1% of		
	(1) 5	(2) 10	(3) 6	(4) 7		
24.	Sulphur trioxide is prep $S_8(s) + 8O_2(g) - 2SO_2(g) + O_2(g)$	ared by the following two $\rightarrow 8SO_2(g)$ g) $\rightarrow 2SO_3(g)$	o reactions			

	How many grams of SO ₃ are produced from 1 mol of S ₈ ?						
	(1) 1280.0	(2) 640.0	(3) 960.0	(4) 320.0			
25.	Methyl-t-butyl ether, (oxygen gas, O_2 are re-	$D_5H_{12}O$, is added to gas equired to burn 1.0 mol c	soline to promote cleane of this compound comple	er burning.How many moles of tely to form carbon dioxide and			
26.	(1) 4.5 mol Maximum number of r 0.4 mole of sodium ph $BaCl_2 + Na_3P$	(2) 6.0 mol noles of barium phospha osphate is $O_4 \longrightarrow Ba_3(PO_4)_2 + N$	(3) 7.5 mol Ite formed when excess aCl	(4) 8.0 mol of barium chloride is mixed with			
	(1) 0.2	(2) 0.4	(3) 0.9	(4) 1.3			
27.	In the reaction, 2KCIC at N.T.P. will be :	$\theta_3 \rightarrow 2$ KCl + 3 O_2 when 36	3.75 g of KClO_3 is heated	d, the volume of oxygen evolved			
	(1) 9.74 dm ³	(2) 8.92 dm ³	(3) 10.08 dm ³	(4) 22.4 dm ³			
28.	One mole of potassiur the gaseous product.	n chlorate (KClO ₃) is the How many mol of alumini	rmally decomposed and um oxide (Al ₂ O ₃) are forr	excess of aluminium is burnt in med ?			
	(1) 1	(2) 1.5	(3) 2	(4) 3			
29.	Assuming that petrol is	s iso-octane (C ₈ H ₁₈) and	has a density 0.8 g ml ^{-1} ,	1.425 litre of petrol on complete			
	combustion will consul (1) 50 L	me oxygen ? (2) 125 L	(3) 125 mol	(4) 50 mol			
30.	21.6 g of silver coin is as AgCl. The weight o (1) 50%	dissolved in HNO ₃ . Whe f AgCl is found to be 14.3 (2) 75%	 n NaCl is added to this s 35 g then % of silver in cc (3) 100% 	solution, all silver is precipitated bin is : (4) 15%			
31.	25.4 g of iodine and 1	4.2g of chlorine are mad	de to react completely to ormed.) yield a mixture of ICI and ICI_3 .			
	Calculate the number						
	(1) 0.1 mole, 0.1 mole	(2) 0.1 mole, 0.2 mole	(3) 0.5 mole, 0.5 mole	(4) 0.2 mole, 0.2 mole			
32.	(1) 0.1 mole, 0.1 mole A mixture of 1.0 mole	(2) 0.1 mole, 0.2 mole of Cl_2	(3) 0.5 mole, 0.5 mole are allowed to react as :	(4) 0.2 mole, 0.2 mole			
32.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole $2AI (s) + 3CI_2(s)$ (1) Which is limiting re (2) How many moles of (3) Moles of excess re	(2) 0.1 mole, 0.2 mole of Al and 3.0 mole of Cl_2 (g) \longrightarrow 2AlCl ₃ (s) agent ? of AlCl ₃ are formed agent left unreacted is	(3) 0.5 mole, 0.5 mole are allowed to react as :	(4) 0.2 mole, 0.2 mole			
32.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole $2AI (s) + 3CI_2(s)$ (1) Which is limiting re (2) How many moles of (3) Moles of excess re (1) (1) AI, (2) 1.0	(2) 0.1 moles of related rel_3 moles of Al and 3.0 mole of Cl_2 (g) \longrightarrow 2AlCl ₃ (s) agent ? of AlCl ₃ are formed agent left unreacted is (3) 1.5	(3) 0.5 mole, 0.5 mole are allowed to react as : (2) (1) Cl_2 , (2) 2.0	(4) 0.2 mole, 0.2 mole (3) 2.0			
32.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole $2AI (s) + 3CI_2(s) + 3CI_2(s$	(2) 0.1 moles of related rel_3 mole of Al and 3.0 mole of Cl_2 (g) \longrightarrow 2AlCl ₃ (s) agent ? of AlCl ₃ are formed agent left unreacted is (3) 1.5 (3) 1.5	(3) 0.5 mole, 0.5 mole are allowed to react as : (2) (1) Cl_2 , (2) 2.0 (4) (1) Cl_2 , (2) 1.0	(4) 0.2 mole, 0.2 mole (3) 2.0 (3) 1.5			
32. 33.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole 2Al (s) + $3Cl_2$ (1) Which is limiting re (2) How many moles of (3) Moles of excess re (1) (1) Al, (2) 1.0 (3) (1) Al, (2) 0.5 Zinc and hydrochloric Zn(s) + 2HCl(a	(2) 0.1 moles of relating rel_3^{n} , (2) 0.1 mole, 0.2 mole of Al and 3.0 mole of Cl_2^{n} , (3) agent ? of AlCl ₃ are formed agent left unreacted is (3) 1.5 (3) 1.5 acid react according to the aq.) $\longrightarrow \operatorname{ZnCl}_2(\operatorname{aq.})$ +	(3) 0.5 mole, 0.5 mole are allowed to react as : (2) (1) Cl_2 , (2) 2.0 (4) (1) Cl_2 , (2) 1.0 in reaction. - $H_2(g)$	(4) 0.2 mole, 0.2 mole (3) 2.0 (3) 1.5			
32. 33.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole 2Al (s) + $3Cl_2$ (1) Which is limiting re (2) How many moles of (3) Moles of excess re (1) (1) Al, (2) 1.0 (3) (1) Al, (2) 0.5 Zinc and hydrochloric Zn(s) + 2HCl(a If 0.30 mole of Zn are	(2) 0.1 moles of relating relation $relation relation (2)$ 0.1 mole, 0.2 mole of Al and 3.0 mole of Cl_2 (g) $\longrightarrow 2AlCl_3(s)$ agent ? of AlCl_3 are formed agent left unreacted is (3) 1.5 (3) 1.5 acid react according to the aq.) $\longrightarrow ZnCl_2(aq.) +$ added to hydrochloric ac	(3) 0.5 mole, 0.5 mole are allowed to react as : (2) (1) Cl_2 , (2) 2.0 (4) (1) Cl_2 , (2) 1.0 ne reaction. - $H_2(g)$ bid containing 0.52 mole	 (4) 0.2 mole, 0.2 mole (3) 2.0 (3) 1.5 HCl, how many moles of H₂ are 			
32. 33.	Calculate the number (1) 0.1 mole, 0.1 mole A mixture of 1.0 mole 2Al (s) + $3Cl_2$ ((1) Which is limiting re (2) How many moles of (3) Moles of excess re (1) (1) Al, (2) 1.0 (3) (1) Al, (2) 0.5 Zinc and hydrochloric Zn(s) + 2HCl(a If 0.30 mole of Zn are produced ? (1) 0.26	(2) 0.1 moles of relating roles of relating roles (2) 0.1 mole, 0.2 mole of Al and 3.0 mole of Cl_2 (g) $\longrightarrow 2AlCl_3(s)$ agent ? of AlCl_3 are formed agent left unreacted is (3) 1.5 (3) 1.5 (3) 1.5 acid react according to the aq.) $\longrightarrow ZnCl_2(aq.) +$ added to hydrochloric ac (2) 1.04	(3) 0.5 mole, 0.5 mole are allowed to react as : (2) (1) Cl_2 , (2) 2.0 (4) (1) Cl_2 , (2) 1.0 the reaction. - $H_2(g)$ cid containing 0.52 mole (3) 0.52	 (4) 0.2 mole, 0.2 mole (3) 2.0 (3) 1.5 HCl, how many moles of H₂ are (4) 0.13 			

formed. How many mole of SO_2 and O_2 did not enter into combination ?

MOLE CONCEPT

	(1) 2 moles of SO ₂ , 11 moles of O ₂		(2) 3 moles of SO_2 , 11.5 moles of O_2				
	(3) 2 moles of SO_2 , 4 m	noles of O_2	(4) 8 moles of SO_2 , 4 m	noles of O ₂			
35.	0.5 mole of H_2SO_4 is formed is	mixed with 0.2 mole of	Ca $(OH)_2$. The maximum	im number of moles of $CaSO_4$			
	(1) 0.2	(2) 0.5	(3) 0.4	(4) 1.5			
36.	Equal moles of H ₂ O an	d NaCl are present in a s	olution. Hence, molality	of NaCI solution is :			
	(1) 0.55	(2) 55.5	(3) 1.00	(4) 0.18			
37.	 7. Decreasing order of mass of pure NaOH in each of the aqueous solution. (I) 50 g of 40% (W/W) NaOH (II) 50 ml of 50% (W/V) NaOH (d_{sol} = 1.2 g/ml). (III) 50 g of 15 M NaOH (d_{sol} = 1 g/ml). 						
	(1) I, II, III	(2) III, II, I	(3) II, III, I	(4) III = II = I.			
38.	What is the quantity o methanol as 0.25 :	f water that should be	added to 16 g. methand	ol to make the mole fraction of			
	(1) 27 g.	(2) 12 g.	(3) 18 g.	(4) 36 g.			
39.	When 25 g of Na_2SO_4 is	s dissolved in 10³ Kg of s	olution, its concentration	will be			
	(1) 2.5 ppm	(2) 25 ppm	(3) 250 ppm	(4) 100 ppm			
40.	The molar concentratio (1) 1	n of pure water at 4ºC ar (2) 5.5	nd 1 atm pressure is (3) 18	(4) 55.5			
41.	20 g of solute X are dis molalities of the solutes of solute X to that of the	ssolved in 50 g of water. s in these two solutions a e solute Y is	15 g of solute Y are dis are the same. Hence, th	solved in 70 g of benzene. The e ratio of the molecular weights			
	(1) 7:5	(2) 4:3	(3) 15:28	(4) 28:15			
42.	A 500 g toothpaste sar will be :	nple has 0.4 g fluoride c	oncentration. The fluorid	e concentration in terms of ppm			
	(1) 200	(2) 400	(3) 500	(4) 800			
43.	The volume of water 0.2 M HCl to obtain 0.2	that must be added to 5 M solution of HCl is :	a mixture of 250 ml	of 0.6 M HCl and 750 ml of			
	(1) 750 ml	(2) 100 ml	(3) 200 mℓ	(4) 300 mℓ			
44.	What is the Na⁺ ion co with 50 mL of 0.30M Na	procentration in the soluti a_3PO_4 solution ?	on formed by mixing 20	mL of 0.10 M Na_2SO_4 solution			
	(1) 0.15 M	(2) 0.24 M	(3) 0.48	(4) 0.70			
45.	Silver metal reacts with 3Ag (s) + 4HNO ₃ (aq) -	nitric acid according to t \longrightarrow 3AgNO ₃ (aq) + NC	he equation (g) + $2H_2O(I)$	ie _			
	(1) 4.74 mL	(2) 6.32 mL	(3) 8.43 mL	(4) 25.3 mL			

46.	H ₃ PO ₄ (98 g mol ⁻¹) is (1) 18	s 98% by mass of solutio (2) 20	on. If the density is 1.8 (3) 22	g/ml, calculate the molarity. (4) 24
47.	What volume of 0.1 in which the molarity	$0 \text{ M H}_2 \text{SO}_4 \text{ must be add}$ of the H ₂ SO ₄ is 0.050 M	ed to 50 mL of a 0.10 1 ?	M NaOH solution to make a solution
	(1) 400 mL	(2) 50 mL	(3) 100 mL	(4) 150 mL
48.2	1 mole of N ₂ H ₄ loses appears in the new oxidation state of hy	s ten moles of electrons compound, what is the drogen).	to form a new compound to form a new compound to form a new composition state of nitrogeneration	und Y. Assuming that all the nitrogen gen in Y? (There is no change in the
	(1) – 1	(2) – 3	(3) + 3	(4) + 5
49.	The average oxidati (1) – 8/3	on state of Fe in $Fe_{3}O_{4}$ i (2) 8/3	s : (3) 2	(4) 3
50.	The number of elect $NO_3^- + 4H^+$	rons required to balance + $e^- \longrightarrow 2H_2O + NO$ is	e the following equation	l,
	(1) 5	(2) 4	(3) 3	(4) 2
	(1) 1 : 5 Fyercis	(2) 5 : 1 (3)	2:3 (4	l) 3 : 2
	PART - I :		UESTION (PRE	VIOUS YEARS)
1.	The percentage of S	e in peroxidase anhydro	bus enzyme is 0.5% by	v weight (atomic weight = 78.4). Then
	(1) 1.568×10^4	(2) 1.568×10^3	(3) 15.68	(4) 3.316×10^4
2.	The mass of carbo aluminium metal from (Atomic mass : Al =	n anode consumed (gi m bauxite by the Hall pro 27)	ving only carbon diox ocess is :	ide) in the production of 270 kg of [AIPMT 2005]
	(1) 90 kg	, (2) 540 kg	(3) 180 kg	(4) 270 kg
3.	An element X has th	e following isotopic com ²⁰⁰ X : 90% ¹⁹⁹ X : 8.0% ²⁰² X : 2.0%	position :	[AIPMT 2007]
	The weighted avera (1) 199 amu	ge atomic mass of the n (2) 200 amu	aturally occurring elem (3) 201 amu	ent X is closest to : (4) 202 amu
4.	How many moles of HCI?	lead (II) chloride will be	formed from a reactio	n between 6.5 g of PbO and 3.2 g of [AIPMT 2008]
	(1) 0.044	(2) 0.333	(3) 0.011	(4) 0.029
5.	An organic compou and H, 9.67%. The e	nd contains carbon, hydempirical formula of the	drogen and oxygen. Its compound would be :	s chemical analysis gave C, 38.71% [AIPMT 2008]

СН	EMISTRY FOR	NEET		MOLE CO	
	(1) CH ₃ O	(2) CH ₂ O	(3) CHO	(4) CH ₄ O	
6.	What volume of o propane gas (C ₃ H	oxygen gas (O ₂) measu I_8) measured under the s	red at 0°C and 1 atm is ame conditions?	needed to burn c	completely 1 L of [AIPMT 2008]
	(1) 7 L	(2) 6 L	(3) 5 L	(4) 10 L	
7.	Volume occupied	by one molecule of wate	r (density = 1 g cm ⁻³) is :		[AIPMT 2008]
	(1) 9.0 × 10 ^{−23} cm	1^{3} (2) 6.023 × 10 ⁻²³	cm ³ (3) 3.0×10^{-23} cm ³	(4) 5.5 × 10 ⁻ ∕	⁵ cm ⁵
8.	What is the [OH⁻] M Ba(OH) ₂ ?	in the final solution prep	ared by mixing 20.0 mL of	0.050 M HCI with	n 30.0 mL of 0.10 [AIPMT-2009]
	(1) 0.10 M	(2) 0.40 M	(3) 0.0050 M	(4) 0.12 M	
9.	10 g of hydroger produced in this re	n and 64 of oxygen we eaction will be.	ere filled in a steel vesse	I and exploded.	Amount of water [AIPMT 2009]
	(1) 2 mol	(2) 3 mol	(3) 4 mol	(4) 1 mol	
10.	carbonate dissoci are respectively (1 (1) 0.955 M and 1 (3) 1.90 M and 1.9	ates completely, molar Molar mass of $Na_2CO_3 =$.910 M 910 M	concentration of sodium id 106 g mol ⁻¹) (2) 1.910 M and 0.9 (4) 0.477 M and 0.4	on, Na⁺ and carbo 55 M 77 M	onate ions, CO ₃ ²⁻ [AIPMT-2010]
11.	In Duma's metho collected at 300 k compound would	d of estimation of nitrog K temperature and 715 r be : (Aqueous tension at	en 0.35 g of an organic on mm pressure. The percent 300 K = 15 mm	compound gave 5 age composition	5 mL of nitrogen of nitrogen in the [AIPMT-2011]
	(1) 15.45	(2) 16.45	(3) 17.45	(4) 14.45	
12.	Mole fraction of th (1) 0.1770	e solute in a 1.00 molal a (2) 0.0177	aqueous solution is : (3) 0.0344	(4) 1.7700	[AIPMT-2011]
13.	Which has the ma (1) 44 g CO ₂	ximum number of molec (2) 48 g O ₃	ules among the following ? (3) 8 g H ₂	(4) 64 g SO ₂	[AIPMT-2011]
14.	How many grams ? The concentrate	of concentrated nitric ac ed acid is 70% HNO ₃ .	cid solution should be used	d to prepare 250 r	nL of 2.0M HNO ₃ [NEET 2013]
	(1) 90.0 g conc. H	NO ₃	(2) 70.0 g conc. HN	O ₃	
	(3) 54.0 g conc. H	NO ₃	(4) 45.0 g conc. HN	0 ₃	
15.	$6.02 imes 10^{20}$ molec	ules of urea are present	in 100 mL of its solution. T	he concentration of	of solution is : [NEET 2013]
	(1) 0.01 M	(2) 0.001 M	(3) 0.1 M	(4) 0.02 M	
16.	Equal masses of in identical conditi	H_2 , O_2 and methane have ons. The ratio of the volu	e been taken in a containe Imes of gases H ₂ :O ₂ : meth	er of volume V at t nane would be -	emperature 27ºC [AIPMT 2014]

MOLE CONCEPT

	(1) 8 : 16 : 1	(2) 16 : 8 :1	(3) 16 : 1 : 2	(4) 8 : 1 : 2				
17.	When 22.4 litres of H_2 equal to -	(g) is mixed with 11.2 litr	es of Cl ₂ (g), each at STF	P, the moles of HCl(g) formed is [AIPMT 2014]				
	(1) 1 mol of HCl(g)	(2) 2 mol of HCI(g)	(3) 0.5 mol of HCI(g)	(4) 1.5 mol of HCl(g)				
18.	1.0 g of magnesium is much? (At, wt.Mg = 24	burnt with 0.56 g O_2 in a ; $O = 16$)	a closed vessel. Which re	eaction is left in excess and how [AIPMT 2014]				
	(1) Mg, 0.16 g	(2) O ₂ , 0.16 g	(3) Mg, 0.44 g	(4) O ₂ , 0.28 g				
19.	A mixture of gases co	ntains H_2 and O_2 gases	in the ratio of 1:4 (w/w). What is the molar ratio of the				
	two gases in the mixtu	re ?		[AIPMT 2015]				
	(1) 4 : 1	(2) 16 : 1	(3) 2 : 1	(4) 1 : 4				
20.	Suppose the elements and XY_2 weights 10 g a	X and Y combine to for and 0.05 mole of $X_{3}Y_{2}$ we	m two compounds XY_2 a eights 9 g, the atomic wei	and X_3Y_2 . When 0.1 mole of XY_2 ghts of X and Y are [NEET-2 2016]				
	(1) 30, 20	(2) 40, 30	(3) 60, 40	(4) 20, 30				
21.	Which of the following	is dependent on tempera	ature ?	[NEET- 2017]				
	(1) Molality	(2) Molarity	(3) Mole fraction	(4) Weight percentage				
22.	In which case is the number of molecules of water maximum ? [NEET- 2018] (1) 18 mL of water (2) 10 ⁻³ mol of water (3) 0.00224 L of water vapours at 1 atm and 273 K (4) 0.18 g of water							
	(4) 0.18 g of water							
23.	(4) 0.18 g of water(4) 0.18 g of waterA mixture of 2.3 g forn mixture is passed through the passed the passed through the passed through the passed the passed	nic acid and 4.5 g oxalic ugh KOH pellets. Weight	acid is treated with conc (in g) of the remaining p	e. H ₂ SO ₄ . The evolved gaseous roduct at STP will be INEET- 20181				
23.	 (4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g forn mixture is passed through (1) 1.4 	nic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4	acid is treated with cond (in g) of the remaining p (3) 2.8	:. H ₂ SO ₄ . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0				
23. 24.	 (4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g forn mixture is passed through (1) 1.4 The number of molest Haber's process is : 	nic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 s of hydrogen molecule	acid is treated with cond (in g) of the remaining p (3) 2.8 s required to produce :	 H₂SO₄. The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] 				
23. 24.	 (4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g forn mixture is passed through (1) 1.4 The number of molest Haber's process is : (1) 40 	nic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 s of hydrogen molecule (2) 10	acid is treated with cond (in g) of the remaining p (3) 2.8 s required to produce 3 (3) 20	 c. H₂SO₄ . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] (4) 30 				
23. 24. 25.	 (4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g forn mixture is passed through (1) 1.4 The number of molest Haber's process is : (1) 40 Which of the following 	nic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 (2) 10 reactions are disproporti	acid is treated with cond (in g) of the remaining p (3) 2.8 s required to produce 2 (3) 20 onation reaction ?	 c. H₂SO₄ . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] (4) 30 [NEET-1- 2019] 				
23. 24. 25.	 (4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g forn mixture is passed through the second second	nic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 (2) 10 reactions are disproporti	acid is treated with cond (in g) of the remaining p (3) 2.8 s required to produce 3 (3) 20 onation reaction ? (b) 3MnO ₄ ²⁻ 4H ⁺ 3 2Mi	c. H_2SO_4 . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] (4) 30 [NEET-1- 2019] $nO_4^- + MnO_2 + 2H_2O$				
23. 24. 25.	(4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g form mixture is passed throw (1) 1.4 The number of moles Haber's process is : (1) 40 Which of the following (a) $2Cu^+ cu^{2+} + Cu^0$ (c) $2KMnO_4 \xrightarrow{\Lambda} K_2N$	hic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 (2) 10 (2) 10 reactions are disproporti	acid is treated with cond (in g) of the remaining pl (3) 2.8 s required to produce 3 (3) 20 onation reaction ? (b) $3MnO_4^{2-} 4H^+ \stackrel{?}{\rightarrow} 2Mn$ (d) $2MnO_4^{-} + 3Mn^{2+} + 2$	c. H_2SO_4 . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] (4) 30 [NEET-1- 2019] $hO_4^- + MnO_2 + 2H_2O$ $2H_2O \stackrel{>}{\rightarrow} 5MnO_2 + 4H^+$				
23. 24. 25.	(4) 0.18 g of water (4) 0.18 g of water A mixture of 2.3 g form mixture is passed throw (1) 1.4 The number of moles Haber's process is : (1) 40 Which of the following (a) $2Cu^+ \stackrel{>}{_{\sim}} Cu^{2+} + Cu^0$ (c) $2KMnO_4 \xrightarrow{\Lambda} K_2N$ Select the correct option (1) (a) and (d) only	hic acid and 4.5 g oxalic ugh KOH pellets. Weight (2) 4.4 (2) 10 (2) 10 reactions are disproporti MnO ₄ + MnO ₂ + O ₂ on from the following : (2) (a) and (b) only	acid is treated with cond (in g) of the remaining p (3) 2.8 s required to produce : (3) 20 onation reaction ? (b) $3MnO_4^{2-} 4H^+ \ddagger 2Mit$ (d) $2MnO_4^{2-} + 3Mn^{2+} + 2$ (3) (a), (b) and (c)	e. H_2SO_4 . The evolved gaseous roduct at STP will be [NEET- 2018] (4) 3.0 20 moles of ammonia through [NEET-1- 2019] (4) 30 [NEET-1- 2019] $MO_4^- + MnO_2 + 2H_2O$ $2H_2O \stackrel{2}{_{3}} 5MnO_2 + 4H^+$ (4) (a), (c) and (d)				

- 27. The density of 2 M aqueous solution of NaOH is 1.28 g/cm³. The molality of the solution is [Given that molecular mass of NaOH = 40 gmol⁻¹] [NEET-2- 2019]
 - (1) 1.20 m (2) 1.56 m (3) 1.67 m (4) 1.32 m

PART - II : AIIMS QUESTION (PREVIOUS YEARS)

1.	The molarity of H_2SO_4 solution, which has a density 1.84 g/cc at 35°C and contains 98% by v						
	(1) 1.84 M	(2) 18.4 M	(3) 20.6 M	(4) 24.5 M	[/		
2.	10 ²¹ molecules are rem (1) 2.88 × 10 ⁻³	oved from 200 mg of CC (2) 28.2 × 10 ⁻³	0 ₂ . The mole of CO ₂ left a (3) 288 × 10 ⁻³	re : (4) 28.8 × 10³	[AIIMS 2001]		
3.	The weight of NaCl de HCl were produced in t (1) 6.921 g	composed by 4.9 g of ⊢ he reaction (2) 4.65 g	H_2SO_4 , if 6 g of sodium h (3) 2.925 g	ydrogen sulphat (4) 1.4 g	e and 1.825 of [AIIMS 2001]		
4.	The mass of 70% H_2SC (1) 70 g	D_4 required for neutralizat (2) 35 g	tion of one mole of NaO⊦ (3) 30 g	l is : (4) 95 g	[AIIMS 2002]		
5.	A compound possess 8 (1) 200	% sulphur by mass. The (2) 400	least molecular mass is (3) 155	: (4) 355	[AIIMS 2002]		
6.	Assertion : One molal	aqueous solution of gluc	ose contains 180 g of glu	ucose in 1 kg wa	ter		
	Reason : Solution cont (1) If both assertion and (2) If both assertion and (3) If Assertion is true b (4) If both assertion and	aining one mole of solute d reason are true and rea d reason are true but rea ut reason is false. d reason are false.	e in 1000 g of solvent is o ason is the correct explar son is not the correct exp	called one molal nation of assertio planation of asse	solution. n. rtion.		
7.	 Assertion : One molar aqueous solution has always higher concentration than one molal. Reason : The molality of a solution depends upon the density of the solution where as molarity does not. (1) If both assertion and reason are true and reason is the correct explanation of assertion. (2) If both assertion and reason are true but reason is not the correct explanation of assertion. (3) If Assertion is true but reason is false. (4) If both assertion and reason are true for the solution of the correct explanation of the solution. 						
8.	For preparing of 0.1 M solution of a compound from its impure sample of which the percentage purcharder, the weight of the substance required will be : [AIIMS (1) less than the theoretical weight (2) more than the theoretical weight (3) same as the theoretical weight (4) none of these						
9.	An aqueous solution of required to completely (1) 20 ml	6.3 g of oxalic acid dihy neutralise 10 ml of this so (2) 40 ml	drate is made up to 250 r olution is (3) 10 ml	nl. The volume c (4) 4 ml	of 0.1 N NaOH [AIIMS 2013]		
10.	Which has themaximun (1) 44g CO ₂	n number of molecules a (2) 48 g O₃	mong the following ? (3) 8 g H ₂	(4) 64 g SO ₂	[AIIMS 2014]		
11.	Carbon and oxygen for 27.3%. The given data (1) law of definite propo (3) law of multiple propo	ms two compouds, Carb is in support with : ortions ortions	oon content in one of the (2) law of reciprocal pro (4) law of conservation	m is 42.9% while portions of mass	e in the other is [AIIMS 2015]		

12.	A sample of a mixture of CaCl ₂ and Na ₂ CO ₃ weighing 4.22 g was treated to precipitate all the Ca as CaCO ₃ . This CaCO ₃ is heated and quantitatively converted into 0.959 g of CaO. Calculate the percentage of CaCl ₂ in the mixture. [AIIMS 2016] (Atomic mass of Ca = 40, O = 16, C = 12 and Cl = 35.5) (1) 55.28 % (2) 37.3 % (3) 45.00 % (4) 49.01 %							
13.	If 0.5 moles of BaCl ₂ is that can be formed is (1) 0.7	mixed with 0.2 moles of (2) 0.5	of Na ₃ PO ₄ , the maximum (3) 0.03	number of moles of Ba₃(PO₄)₂ [AIIMS 2017] (4) 0.10				
14.	Mixture of two metals evolve 2.24 L H ₂ at STF (1) 1 gm	having mass 2 gm (A = P. what is mass of A pres (2) 1.5 gm	15, B = 30) and are bi sent in mixture? (3) 0.5 gm	valent and dissolve in HCI and [AIIMS 2018] (4) 0.75 gm				
	PART - III : JE	E MAIN/AIEEE Q	UESTION (PREV	VIOUS YEARS)				
1.	Which of the following of	chemical reactions depic	ts the oxidizing behaviou	r of H ₂ SO ₄ ?				
				[AIEEE-2006, 3/165]				
	(1) 2HI + $H_2SO_4 \rightarrow I_2$ +	SO ₂ + 2H ₂ O	$(2) \operatorname{Ca}(OH)_2 + H_2 SO_4 \rightarrow$	$-CaSO_4 + 2H_2O$				
	(3) NaCl + $H_2SO_4 \rightarrow Na$	iHSO₄ + HCI	$(4) 2PCI_5 + H_2SO_4 \rightarrow 2F$	$POCI_3 + 2HCI + SO_2CI_2$				
2.	How many moles of ma	agnesium phosphate, Mg	$_{3}(PO_{4})_{2}$ will contain 0.25	mole of oxygen atoms ? [AIEEE-2006, 3/165]				
	(1) 0.02	(2) 3.125 × 10 ⁻²	(3) 1.25 × 10⁻²	(4) 2.5 × 10 ^{−2}				
3.	Density of a 2.05M solu	ition of acetic acid in wat	er is 1.02 g/ml. The mola	ality of the solution is : [AIEEE-2006, 3/165]				
	(1) 1.14 mol kg ⁻¹	(2) 3.28 mol kg ⁻¹	(3) 2.28 mol kg ⁻¹	(4) 0.44 mol kg ⁻¹				
4.	In the reaction $2AI_{(s)} + 6HCI_{(aq)} \rightarrow 2AI^{3}$ (1) 61 HCL is consumed	$+_{(aq)} + 6CH_{(aq)} + 3H_2 (g)$	and	[AIEEE-2007, 3/120]				
	(1) OL $HOI_{(aq)}$ is consum	ed for every $3 \square \square_2$ produced to a produced to a set of the set	ure and pressure for eve	ry moles that reacts				
	(2) 33.6 L $H_{2(g)}$ is produce (3) 67.2 L $H_{2(g)}$ at STP is (4) 11.2 L $H_{2(g)}$ at STP is	s produced for every mol	e of AI that reacts . e of HCI _(aq) consumed.	ry moles that reacts.				
5.	The density (in g mL ⁻¹) by mass will be :	of a 3.60 M sulphuric ac	id solution that is 29% (H	H_2SO_4 molar mass = 98 g mol ⁻¹) [AIEEE-2007, 3/120]				
	(1) 1.22	(2) 1.45	(3) 1.64	(4) 1.88				
6.	A 5.2 molal aqueous so	olution of methyl alcohol,	$\mathrm{CH}_3\mathrm{OH}$, is supplied. Wh	at is the mole fraction of methyl				
	(1) 0.100	(2) 0.190	(3) 0.086	(4) 0.050				

MOLE CONCEPT

7.	7. The molality of a urea solution in which 0.0100 g of urea, [(NH ₂) ₂ CO] is added to 0.3000 dm ³ of wa						
	at STP is:		[f	Re. Paper AIEEE-2011, 3/120]			
	(1) 5.55 × 10 ⁻⁴	(2) 33.3 m	(3) 3.33 × 10 ^{−2} m	(4) 0.555 m			
8.	The density of a solution 1.15 g/mL. The molarity	on prepared by dissolving y of this solution is :	g 120 g of urea (mol. ma	ss = 60 u) in 1000 g of water is [AIEEE-2012, 4/120]			
	(1) 0.50 M	(2) 1.78 M	(3) 1.02 M	(4) 2.05 M			
9.	The molarity of a solution	on obtained by mixing 75	i0 mL of 0.5(M) HCI with	250 mL of 2(M)HCl will be : [JEE(Main)-2013, 4/120]			
	(1) 0.875 M	(2) 1.00 M	(3) 1.75 M	(4) 0.975 M			
10.	Consider the following	reaction :					
	$xMnO_{4}^{-} + yC_{2}O_{4}^{2-} + zH$	$^{+} \rightarrow xMn^{2+} + 2yCO_2 + \frac{z}{2}$	H ₂ O				
	The values of x, y and z	z in the reaction are, resp	pectively :	[JEE(Main)-2013, 4/120]			
	(1) 5, 2 and 16	(2) 2, 5 and 8	(3) 2, 5 and 16	(4) 5, 2 and 8			
11.	The ratio of masses of of their molecule is :	oxygen and nitrogen in a	ı particular gaseous mixt	ure is 1 : 4. The ratio of number [JEE(Main)-2014, 4/120]			
	(1) 1 : 4	(2) 7 : 32	(3) 1 : 8	(4) 3 : 16			
12.	The molecular formula	of a commercial resin us	ed for exchanging ions ir	n water softening is C ₈ H ₇ SO ₃ Na			
	(Mol. wt. 206). What w per gram resin ?	ould be the maximum up	otake of Ca ²⁺ ions by the	e resin when expressed in mole [JEE(Main)-2015, 4/120]			
	(1) $\frac{1}{103}$	(2) $\frac{1}{206}$	(3) $\frac{2}{309}$	(4) $\frac{1}{412}$			
13.	The most abundant ele Carbon (22.9%), Hydro if all ¹ H atoms are repla	ements by mass in the ogen (10.0%) ; and Nitrog aced by ² H atoms is :	body of a healthy huma jen (2.6%). The weight w	n adult are : Oxygen (61.4%); hich a 75 kg person would gain [JEE(Main)-2017, 4/120]			
	(1) 37.5 kg	(2) 7.5 kg	(3) 10 kg	(4) 15 kg			
14.	1 gram of a carbonate	(M_2CO_3) on treatment	with excess HCI produc	ces 0.01186 mole of CO_2 . The			
	molar mass of M_2CO_3 in	n g mol⁻¹ is :		[JEE(Main)-2017, 4/120]			
	(1) 84.3	(2) 118.6	(3) 11.86	(4) 1186			
15.	Which of the following r	reactions is an example o	of a redox reaction ?	[JEE(Main)-2017, 4/120]			
	(1) $XeF_2 + PF_5 \longrightarrow [Xeff]$	₽F]⁺ PF ₆	$(2) XeF_6 + H_2O \longrightarrow Xe$	$OF_4 + 2HF$			
	$(3) XeF_6 + 2H_2O \longrightarrow X$	$(eO_2F_2 + 4HF)$	$(4) XeF_4 + O_2F_2 \longrightarrow Xe$	$PF_6 + O_2$			

16.	The ratio of mass percent of C and H of an organic compound (C _x H _Y O _z) is 6 :1. If one molecule of the above compound (C _x H _Y O _z) contains half as much oxygen as required to burn one molecule of compound C _x H _Y completely to CO ₂ and H ₂ O.The empirical formula of compound C _x H _Y O _z is :					
				[JEE(Main)-2018, 4/120]		
	(1) C ₃ H ₄ O ₂	(2) C ₂ H ₄ O ₃	(3) C ₃ H ₆ O ₃	(4) C ₂ H ₄ O		
17.	For the following re	eaction, the mass of wate	r produced from 445 g o	f C ₅₇ H ₁₁₀ O ₆ is : [JEE(Main)-2019, 4/120]		
	2C ₅₇ H ₁₁₀ O ₆ (s) + 16	3O₂(g) → 114CO₂(g) + 110H ₂ O(I)			
	(1) 490 g	(2) 445 g	(3) 495 g	(4) 890 g		
18.	A solution of sodiu that solution in mol	m sulfate contains 92 g c l kg ⁻¹ is :	of Na⁺ ions per kilogram	of water. The molality of Na ⁺ ions in [JEE(Main)-2019, 4/120]		
	(1) 16	(2) 12	(3) 8	(4) 4		
19.	The amount of sug	ar (C_{12} H_{22} O_{11}) required	to prepare 2 L of its 0.1	M aqueous solutions is: [JEE(Main)-2019, 4/120]		
	(1) 68.4 g	(2) 34.2 g	(3) 17.1 g	(4) 136.8 g		
20.	A mixture of 100 m was made up to resulting solution, r g mol ⁻¹ , respective (1) 13.6 g. 0.14 mc	n mol of Ca(OH) ₂ and 2 g 100 mL. The mass of c respectively, are : (Molar ly; K_{sp} of Ca(OH) ₂ is 5.5 y of L ⁻¹	of sodium sulphate was calcium sulphate formed mass of Ca(OH) ₂ , Na ₂ S × 10 ⁻⁶) (2) 13.6 g. 0.28 mo	s dissolved in water and the volume d and the concentration of OH ⁻ in O ₄ and CaSO ₄ are 74, 143 and 136 [JEE(Main)-2019, 4/120]		
	(3) 1.9 g, 0.28 mol	L ⁻¹	(4) 1.9 g, 0.14 mol	L ⁻¹		
21.	An organic compo moles of H ₂ O and	und is estimated through 1 mole of nitrogen gas. The (2) C H N	Dumus method and was he formula of the compo	s found to evolve 6 moles of CO ₂ , 4 und is: [JEE(Main)-2019, 4/120]		
	$(1) C_6 H_8 N$	(2) C6H8IN2	$(3) C_{12} H_{8} N_{2}$	(4) U12H8IN		
22.	A 10 mg effervesc T = 298.15 K and	ent tablet containing sod 1 p = 1 bar. If molar vo	ium bicarbonate and oxa lume of CO2 is 25.0 L	alic acid releases 0.25 ml of CO_2 at under such condition, what is the		
	percentage of sodi [Molar mass of Nal	um bicarbonate in each ta HCO₃ = 84 g mol⁻¹]	ablet ?	[JEE(Main)-2019, 4/120]		
	(1) 0.84	(2) 33.6	(3) 8.4	(4) 16.8		
23.	8 g of NaOH is dis the solution respec	solved in 18 g of H₂O. M tively are :	ole fraction of NaOH in s	solution and molality (in mol kg ⁻¹) of [JEE(Main)-2019, 4/120]		
	(1) 0.2, 11.11	(2) 0.167, 11.11	(3) 0.167, 22.20	(4) 0.2, 22.20		

Answers			E										
)	F		CISE	- 1					
SECTI	ON (A)						0.01	-					
1. 8. SECTI	(2) (3) ON (B)	2.	(1)	3.	(4)	4.	(3)	5.	(1)	6.	(1)	7.	(3)
1. 8.	(2) (2)	2. 9.	(4) (1)	3. 10.	(1) (2)	4. 11.	(1) (4)	5. 12.	(2) (3)	6. 13.	(1) (1)	7. 14.	(4) (1)
15. 22. SECTI	(1) (2) ON (C)	16. 23.	(3) (1)	17. 24.	(1) (1)	18. 25.	(2) (2)	19.	(3)	20.	(4)	21.	(2) (2)
1. SECTI	(2) ON (D)	2.	(3)	3.	(1)								
1. SECTI	(1) ON (E)	2.	(1)	3.	(2)	4.	(2)	5.	(2)	6.	(2)	7.	(1)
1. 8. SECTI	(3) (1) ON (F)	2. 9.	(3) (2)	3. 10.	(2) (4)	4. 11.	(2) (2)	5. 12.	(1) (2)	6. 13.	(4) (2)	7. 14.	(4) (1)
1. SECTI	(2) ´ ON (G)	2.	(2)	3.	(1)	4.	(4)						
1. SECTI	(3) ´ ON (H)	2.	(2)	3.	(3)	4.	(2)	5.	(4)	6.	(1)		
1. 8. SECTI	(2) (3) ON (I)	2. 9.	(3) (4)	3. 10.	(2) (3)	4. 11.	(2) (1)	5.	(4)	6.	(3)	7.	(1)
1. 8. SECTI	(3) (4) ON (J)	2. 9.	(2) (2)	3. 10.	(4) (1)	4.	(2)	5.	(2)	6.	(1)	7.	(1)
1. SECTI	(4) ON (K)	2.	(3)	3.	(2)	4.	(1)	5.	(4)				
1.	(3)	2.	(1)	3.	(3)	4.	(4)	-					
		-		-	E	EXER	CISE	- 2	(-)	-		_	
1. 8. 15. 22. 29. 36. 43. 50.	(2) (2) (3) (1) (3) (2) (3) (3)	2. 9. 16. 23. 30. 37. 44. 51.	(4) (3) (4) (2) (1) (2) (4) (2)	3. 10. 17. 24. 31. 38. 45.	(1) (1) (2) (1) (1) (3)	4. 11. 25. 32. 39. 46.	(1) (1) (3) (3) (1) (2) (1)	5. 12. 19. 26. 33. 40. 47.	(2) (3) (1) (1) (1) (4) (3)	6. 13. 20. 27. 34. 41. 48.	(2) (3) (1) (3) (1) (4) (3)	7. 14. 21. 28. 35. 42. 49.	(4) (1) (1) (1) (4) (2)
					E	EXER	CISE	- 3					
	(1)		(_	(2)	PA	RT-I	_	<i>(</i>))		(5)	_	(2)
1. 8. 15. 22.	(1) (1) (1) (1)	2. 9. 16. 23.	(1) (3) (3) (3)	3. 10. 17. 24.	(2) (2) (1) (4)	4. 11. 18. 25. PA	(4) (2) (1) (2) RT-II	5. 12. 19. 26.	(1) (2) (1) (3)	6. 13. 20. 27.	(3) (3) (2) (3)	7. 14. 21.	(3) (4) (2)
1. 8.	(2) (2)	2. 9.	(1) (2)	3. 10.	(3) (3)	4. 11. P A	(1) (3) RT-III	5. 12.	(2) (3)	6. 13.	(1) (4)	7. 14.	(4) (1)
1. 8. 15. 22.	(1) (4) (4) (3)	2. 9. 16. 23.	(2) (1) (2) (2)	3. 10. 17.	(3) (3) (3)	4. 11. 18.	(4) (2) (4)	5. 12. 19.	(1) (4) (1)	6. 13. 20.	(3) (2) (3)	7. 14. 21.	(1) (1) (2)