Kattar NEET 2026

Physical Chemistry

Some Basic Concepts of Chemistry

Q1 Suppose two elements X and Y combine to form two compounds XY_2 and X_2Y_3. 0.05 mole of XY_2 weighs 5g while 3.011×10^{23} molecules of X_2Y_3 weigh 85g. The atomic masses of X and Y are respectively

(A) 20, 30 (B) 30, 40
(C) 40, 30 (D) 80, 60

Q2 Caffeine has a molecular weight of 194. It contains 28.9% by mass of nitrogen. Number of atoms of nitrogen in one molecule of it:

(A) 2 (B) 3
(C) 4 (D) 5

Q3 What is the volume percentage of a solution formed by dissolving 75.0 mL of a solute into 155.0 mL of a solvent?

(A) 4.84% (B) 48.4%
(C) 32.6% (D) 3.26%

Q4 The density of water is 1 g/mL. What is the volume occupied by 1 molecule of water?

(A) 1.44×10^{-20} mL
(B) 1 mL
(C) 18 mL
(D) 2.99×10^{-23} mL

Q5 60 g of solution containing 40% by mass of NaCl are mixed with 100 g of a solution containing 15% by mass NaCl. Determine the mass percent of sodium chloride in the final solution.

(A) 24.4% (B) 78%
(C) 48.8% (D) 19.68

Q6 Which of the following is the best example of Law of conservation of mass?

(A) 12 g of carbon combines with 32 g of oxygen to form 44 g of CO_2
(B) When 12 g of carbon is heated in a vacuum there is no change in mass
(C) A sample of air increases in volume when heated at constant pressure but its mass remains unaltered
(D) The weight of a piece of platinum is the same before and after heating in air

Q7 1.0 g of an oxide of A contained 0.5 g of A.4.0 g of another oxide of A contained 1.6 g of A. The data indicate the law of

(A) Conservation of mass
(B) Constant proportions
(C) Conservation of energy
(D) Multiple proportions

Q8 If 500ml of 1M solution of glucose is mixed with 500ml of 1M solution of glucose final molarity of solution will be

(A) 1 M (B) 0.5 M
(C) 2 M (D) 1.5 M

Q9 Find mass of 18.066×10^{23} molecules of NH_3 ? (If atomic mass of N and H are 14 and 1)

(A) 51 g (B) 34 g
(C) 17 g (D) 68 g

Q10 The amount of anhydrous Na_2CO_3 present in 250 ml of 0.25M solution is

(A) 6.225 g (B) 66.25 g
(C) 6.0 g (D) 6.625 g

Q11 The hydrated salt $Na_2CO_3 \cdot xH_2O$ undergoes 63% loss in mass on heating and becomes anhydrous. The value of x is:

(A) 10 (B) 12
(C) 8 (D) 18

Q12

The empirical formula of a compound is CH_2O. 0.0835 moles of the compound contains 1.0 g of hydrogen. Molecular formula of the compound is

(A) $C_6H_{12}O_6$ (B) $C_5H_{10}O_5$
(C) $C_4H_8O_8$ (D) $C_3H_6O_3$

Q13 A 5.2 molal aqueous solution of methyl alcohol, CH_3OH, is supplied. What is the mole fraction of methyl alcohol in the solution?

(A) 0.100 (B) 0.190
(C) 0.086 (D) 0.050

Q14 According to the equation,

$N_2O_3(g) + 6H_2(g) \rightarrow 2NH_3(g) + 3H_2O(g)$

How many moles of $NH_3(g)$ could be formed from the reaction of 0.22 mol of N_2O_3 (g) with 0.87 mol of H_2 (g)?

(A) 0.29 mol (B) 0.44 mol
(C) 0.73 mol (D) 1.1 mol

Q15 If 0.5 mol of $BaCl_2$ is mixed with 0.1 mole of Na_3PO_4, the maximum number of mole of $Ba_3(PO_4)_2$ that can be formed is

(A) 0.7 (B) 0.05
(C) 0.30 (D) 0.10

Q16 If 10^{21} molecules are removed from 200 mg of CO_2, then the number of moles of CO_2 left are

(A) 2.88×10^{-3}
(B) 28.8×10^{-3}
(C) 0.288×10^{-3}
(D) 1.68×10^{-2}

Q17 Given, 5×10^3 kg of urea is dissolved in 2×10^3 kg of water. Calculate the percent by mass of urea.

(A) 90% (B) 71.42%
(C) 70% (D) 80%

Q18 Dissolving 120 g of urea (mol. wt. 60) in 1000 g of water gave a solution of density 1.15 g/mL. The molarity of the solution is

(A) 1.78 M (B) 2.00 M
(C) 2.05 M (D) 2.22 M

Q19 What is the concentration of nitrate ions if equal volumes of 0.1 M $AgNO_3$ and 0.1 M NaCl are mixed together?

(A) 0.1 M (B) 0.2 M
(C) 0.05 M (D) 0.25 M

Q20 90 gm glucose is dissolved in 800 gm water to get a solution of density $\frac{89}{80}\text{gm}/\text{ml}$. The **correct** concentration of solution is:

(A) $\frac{90}{8}\%(\text{w}/\text{w})$ (B) $\frac{90}{8}\%(\text{w}/\text{v})$
(C) 0.625% (w/w) (D) 0.625% (w/v)

Q21 Fe_2O_3 reacts with excess CO at a high temperature according to the equation below:

$$\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\,\text{CO}_2$$

If 6.50 g of Fe_2O_3 yields 3.85 g of Fe , what is the percentage yield of the reaction?

(A) 59.2% (B) 69.9%
(C) 76.3% (D) 84.7%

Q22 One mole of potassium chlorate ($KClO_3$) is thermally decomposed and excess of aluminium is burnt in the gaseous product. How many mol of aluminium oxide (Al_2O_3) are formed?

(A) 1 (B) 1.5
(C) 2 (D) 3

Q23 Given below are two statements:

Statement I: One molal aqueous solution of glucose contains 180 g of glucose in 1 kg of water.

Statement II: A solution containing one mole of solute in 1000 g of solvent is called one molal solution.

In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Statement I is correct but Statement II is incorrect.
(B) Statement I is incorrect but Statement II is correct.
(C) Both Statement I and Statement II are correct.
(D) Both Statement I and Statement II are incorrect.

Q24 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and

how much?
(At. wt. Mg = 24; O = 16)
(A) Mg, 0.16 g (B) O_2, 0.16 g
(C) Mg, 0.44 g (D) O_2, 0.28 g

Q25 Match **List-I** with **List-II.**

List-I (Numbers)		List-II (Significant figures)	
(A)	2.653×10^4	(I)	2
(B)	1.00368	(II)	3
(C)	65.4	(III)	6
(D)	0.36	(IV)	4

Choose the **correct** answer from the options given below:
(A) A-IV; B-III; C-II; D-I
(B) A-I; B-III; C-II; D-IV
(C) A-II; B-IV; C-III; D-I
(D) A-IV; B-I; C-II; D-III

Q26 Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: The number of oxygen atoms in 1 g of O_2, 1 g of O_3 and 1 g of atomic oxygen is same.
Reason R: O_2 and O_3 have different molar masses.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is NOT the correct explanation of A.

Q27 How many moles of $Mg_3(PO_4)_2$ will contain 0.4 mole of oxygen atoms ?
(A) 0.75 (B) 0.25
(C) 0.50 (D) 0.05

Q28 A mixture of 2.3 g of formic acid (HCOOH) and 4.5g of oxalic acid $(H_2C_2O_4)$ is treated with Conc. H_2SO_4 as shown

$$HCOOH \xrightarrow{H_2SO_4} H_2O + CO$$

$$H_2C_2O_4 \xrightarrow{H_2SO_4} H_2O + CO + CO_2$$

The evolved gaseous mixture is passed through KOH pellets. The mass of remaining product at STP will be (Given : CO and CO_2 are neutral and acidic in nature respectively).
(A) 1.2g (B) 2.4g
(C) 2.8g (D) 4g

Q29 The mass percentage of nitrogen in Urea (NH_2CONH_2) is;
(A) 46.66 % (B) 32.48 %
(C) 52.22 % (D) 38.88 %.

Q30 What is the molality of aq. H_2SO_4 solution in which mole fraction of H_2SO_4 is 0.1?
(A) 5.23m (B) 4.81 m
(C) 7.45 m (D) 6.17m

Q31 A Biomolecule Contains 0.1 %. Mg by mass. The minimum molecular mass of biomolecule will be;
(A) 12000 u (B) 24000 u
(C) 36000 u (D) 48000 u

Q32 Which of the following concentration terms is affected by temperature ?
(I) Molarity
(II) Density
(III) Molality
(A) I and II only
(B) II and III only
(C) I and III only
(D) I, II and III

Q33 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Formula mass is used for NaCl instead of molecular mass.
Reason R: In solid state, NaCl exist as single entity.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.

(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is NOT the correct explanation of A.

Q34 Match **List-I** with **List-II.**

	List-I		List-II
(A)	2.24 L of O_2 at STP	(I)	0.32 g
(B)	6.022×10^{21} molecules of O_2	(II)	32 g
(C)	1 g molecule of O_2	(III)	0.032 g
(D)	0.001 mole O_2	(IV)	3.2 g

Choose the **correct** answer from the options given below:
(A) A-IV, B-I, C-II, D-III
(B) A-IV, B-III, C-II, D-I
(C) A-II, B-III, C-IV, D-I
(D) A-II, B-I, C-III, D-IV

Q35 5 moles of AB_2 weights 100 g and 10 moles of A_2B weights 300g .
The molar mass (in g mol^{-1}) of A and B respectively are:
(A) $\frac{40}{3}$ and $\frac{20}{3}$
(B) $\frac{40}{3}$ and $\frac{10}{3}$
(C) $\frac{20}{3}$ and $\frac{10}{3}$
(D) $\frac{10}{3}$ and $\frac{20}{3}$

Q36 Given below are two statements:
Statement I: Dalton's Law could explain all the laws of chemical combinations.
Statement II: Precision refers to the closeness of various measurements for the same quantity.
In the light of the above statements, choose the most appropriate answer from the options given below:
(A) Statement I is correct but Statement II is incorrect.
(B) Statement I is incorrect but Statement II is correct.
(C) Both Statement I and Statement II are correct.
(D) Both Statement I and Statement II are incorrect.

Q37 The number of electrons in 0.6 g of CO_3^{2-} is;
(A) 0.3 N_A (B) 0.62 N_A
(C) 0.6 N_A (D) 0.32 N_A

Q38 3.011×10^{23} atoms of an element has mass 2g. The atomic mass of the element is;
(A) 1 u (B) 6 u
(C) 2 u (D) 4 u

Q39 The concentration of H^+ Ions in a solution obtained by mixing 200 ml of 0.1 m H_2SO_4 with 100 ml of 0.1 m NaOH will be;
(A) 0.5 M (B) 0.75 M
(C) 0.1 M (D) 0.2 M

Q40 The density of 5M nitric acid solution in which mass percent of nitric acid is 31.5%; is;
(A) 0.5 g mL^{-1}
(B) 1.5 g mL^{-1}
(C) 1.25 g mL^{-1}
(D) 1 g mL^{-1}

Q41 2g of M_2CO_3 on treatment with excess HCl produces 0.01 mole of CO_2. The molar mass of M (in g mol^{-1}) is;
(A) 70 (B) 50
(C) 60 (D) 40

Q42 Given than abundance of isotopes 40^X, 42^X and 44^X are 10%, 80% and 10% respectively. The average atomic mass of X is:
(A) 41.8 (B) 42.0
(C) 42.4 (D) 42.2

Q43 For the reacation;
$N_2\,(g) + 3H_2\,(g) \rightarrow 2\,NH_3\,(g)$
Identify the N_2 as a limiting reagent in the following mixtures
(A) $56g\,N_2 + 10g\,H_2$
(B) $10g\,N_2 + 6g\,H_2$
(C) $28g\,N_2 + 4g\,H_2$
(D) $14g\,N_2 + 2g\,H_2$

Q44

A solution of sodium sulphate contains 69g of Na^+ per kilogram of water. The molality of sodium sulphate in the solution is;

(A) 3m (B) 2m

(C) 1.5m (D) 2.5m

Q45 2 g of activated charcoal was added to 100 ml of 0.04M acetic acid solution in a flask. After some time it was filtered and strength of filterate was found to be 0.02M. The mass of acetic acid (CH_3COOH) adsorbed per gram of charcoal 18;

(A) 0.02 g (B) 0.04 g

(C) 0.06 g (D) 0.08 g

Q46 If the density of methanol is $0.8\ Kg\ L^{-1}$, what is the volume needed for making 2.5 L of its 0.25 M solution?

(A) 35 ml (B) 30 ml

(C) 40 ml (D) 25 ml

Q47 Volume of water required to obtain 0.15 M HCl solution from 0.2 M, 100 mL HCl solution is;

(A) 133.33 mL (B) 43.43 mL

(C) 55.55 mL (D) 33.33 mL

Q48 5.6 L of a gas has mass 11g at STP. The gas may be;

(A) O_3 (B) N_2O

(C) CO_2 (D) SO_2

Q49 Mass of one molecule of nitrogen gas is:

(A) 28 g (B) 14 g

(C) $\frac{28}{N_A}g$ (D) $14N_A g$

Q50 The emperical formula of hydrocarbon that contains 81.82% carbon is;

(A) C_3H_4 (B) C_3H_2

(C) CH_2 (D) C_3H_8

Answer Key

Q1	(C)	Q26	(D)
Q2	(C)	Q27	(D)
Q3	(C)	Q28	(C)
Q4	(D)	Q29	(A)
Q5	(A)	Q30	(D)
Q6	(A)	Q31	(B)
Q7	(D)	Q32	(A)
Q8	(A)	Q33	(A)
Q9	(A)	Q34	(A)
Q10	(D)	Q35	(B)
Q11	(A)	Q36	(B)
Q12	(A)	Q37	(D)
Q13	(C)	Q38	(D)
Q14	(A)	Q39	(C)
Q15	(B)	Q40	(D)
Q16	(A)	Q41	(A)
Q17	(B)	Q42	(B)
Q18	(C)	Q43	(B)
Q19	(C)	Q44	(C)
Q20	(B)	Q45	(C)
Q21	(D)	Q46	(D)
Q22	(A)	Q47	(D)
Q23	(C)	Q48	(C)
Q24	(A)	Q49	(C)
Q25	(A)	Q50	(D)

Hints & Solutions

Q1 Text Solution:
(C)
Let molar mass of XY = 5g / 0.05 mol = 100 g/mol.
Given: 3.011×10^{23} molecules = 0.5 mol of X_2Y_3 = 85g
Molar mass = 170 g/mol.
Solving: x + y = 100 and 2x + 3y = 170 gives x = 40, y = 30

Q2 Text Solution:
Nitrogen % = 28.9%, Molecular mass = 194.
Mass of N = 0.289194 = 56.07 g.
Number of N atoms = 56.07 / 14 = 4.

Q3 Text Solution:
(C)
Volume % = 75 / (75 + 155) 100 = 32.6%

Q4 Text Solution:
Molar volume of water = 18 mL/mol.
Volume of one molecule = 18 / 6.022×10^{23} = 2.99×10^{-23} mL.

Q5 Text Solution:
(A)
First solution: 60 g, 40% NaCl $\rightarrow$NaCl = 0.40 x 60 = 24 g
Second solution: 100 g, 15% NaCl $\rightarrow$NaCl = 0.15 x 100 = 15 g
Total mass of solution:
60 + 100= 160 g
Total NaCl:
24 + 15 = 39g
Final mass % of NaCl:
$\frac{39}{160} \times 100$ = 24.375% $\rightarrow$24.4%

Q6 Text Solution:
12g C + 32g $O_2 \rightarrow$ 44g CO_2 matches Law of Conservation of Mass

Q7 Text Solution:
(D)
Different oxides show different ratios.
$\frac{0.5}{1}$ = 0.5; $\frac{1.6}{4}$ = 0.4
0.5:0.4 = 5:4,
Hence law of multiple proportions.

Q8 Text Solution:
(A)
Both are 1M, same solute and volume no change in molarity. Final molarity = 1M.

Q9 Text Solution:
(A)
18.066×10^{23} molecules = 3 mol.
Mass = 3 $\times$ 17 = 51g.

Q10 Text Solution:
(D)
Moles = 0.25 $\times$ 0.25 = 0.0625 mol;
Mass = 0.0625 $\times$ 10^6 = 6.625g.

Q11 Text Solution:
(A)
Assume molar mass of hydrated salt = M.
Anhydrous = 106g, loss = 63%.
So, total = 286g water lost = 180g = 10 mol x = 10.

Q12 Text Solution:
(A)
0.0835 mol 1.0g H Molar mass = $\frac{1}{0.0835}$ = 12.
High molar mass = $C_6H_{12}O_6$.

Q13 Text Solution:
(C)
Molality = 5.2 mol/kg.
Total moles = 5.2 (CH_3OH) + 55.5 (water)
Mole fraction = 5.2 / (5.2+55.5) = 0.086.

Q14 Text Solution:
(A)
Limiting reagent is N_2O_3: 1 mol makes 2 mol NH_3
0.22 mol makes 0.44 mol NH_3 max; H_3 in excess.

Q15 Text Solution:
(B)
$BaCl_2$ + Na_3PO_4 $Ba_3(PO_4)_2$. 3 $BaCl_2$: 2 Na_3PO_4 LR = Na_3PO_4 0.1 mol forms 0.05 mol.

Q16 Text Solution:
(A)

Step 1: Moles in 0.2 g of CO_2

Moles $\frac{0.2}{44} \approx 0.00455$ mol

Step 2: Convert removed molecules to moles

Moles removed = $\frac{10^{21}}{6.022\times10^{23}} \approx 0.00166\ \text{mol}$

Step 3: Moles left

0.00455 - 0.00166 = 0.00289 mol

So, answer is 2.88×10^{-3} mol

Q17 Text Solution:

(B)

Total mass of solution = mass of urea + mass of water

$= 5 \times 10^3 + 2 \times 10^3 = 7 \times 10^3\ \text{kg}$

Percent by mass of urea:

$$\text{Percent} = \left(\frac{\text{Mass of urea}}{\text{Total mass}}\right) \times 100 = \left(\frac{5\times10^3}{7\times10^3}\right) \times 100$$

$$= \left(\frac{5}{7}\right) \times 100 \approx 71.42\%$$

Q18 Text Solution:

(C)

120g urea = 2 mol;

Volume = $\frac{\text{mass}}{\text{density}} = \frac{1120}{1.15}$ = 973.91 mL = 0.974 L.

Molarity = $\frac{2}{0.974}$ = 2.05 M.

Q19 Text Solution:

(C)

Equal volumes of 0.1 M $AgNO_3$ and 0.1 M NaCl

NO_3 remains = 0.05 M after ppt

Q20 Text Solution:

(B)

- Solute (glucose) = 90 g
- Solvent (water) = 800 g
- Total solution mass = 90 + 800 = 890 g
- Density = $\frac{89}{80}$ g/mL = 1.1125 g/mL
- Volume of solution = $\frac{890}{1.1125} \approx 800\ \text{mL}$

$\frac{90}{800} \times 100 = \frac{90}{8} = \boxed{\frac{90}{8}\%(w/v)}$

Q21 Text Solution:

(D)

Fe_2O_3 = 6.5g mol = $\frac{6.5}{159.6}$ = 0.0407 mol expected

Fe = 0.0814 mol = 0.081456 = 4.56g;

actual = 3.85g. % yield = $\frac{3.85}{4.56} \times 100$ = 84.6%.

Q22 Text Solution:

(A)

Potassium chlorate decomposes on heating to give potassium chloride and oxygen gas:

$2\,KClO_3 \rightarrow 2KCl + 3O_2$

So, 2 moles of $KClO_3$ give 3 moles of O_2.

$\Rightarrow$Therefore,

1 mole of $KClO_3$ gives: $\frac{3}{2} = 1.5\ \text{mol of } O_2$

Step 2: Reaction of Aluminium with Oxygen

Balanced reaction for aluminium with oxygen:

$4Al + 3O_2 \rightarrow 2\,Al_2\,O_3$

From this equation:

3 mol $O_2 \rightarrow$ 2 mol Al_2O_3

So, 1.5 mol $O_2 \rightarrow$ 1 mol Al_2O_3

Q23 Text Solution:

(C)

Both definitions are correct.

Q24 Text Solution:

(A)

Mg = 1.0 g $\rightarrow$ Moles = $\frac{1}{24}$ = 0.0417 mol

O_2 = 0.56 g $\rightarrow$ Moles = $\frac{0.56}{32}$ = 0.0175 mol

Reaction: 2 Mg + $O_2 \rightarrow$ 2 MgO $\rightarrow$ ratio is 2:1

Compare Required Ratio:

To react with 0.0175 mol $O_2 \rightarrow$ needs 0.035 mol Mg

Available Mg = 0.0417 mol $\rightarrow$ Mg is in excess

Excess Mg = 0.0417 - 0.035 = 0.0067 mol = 0.16 g

Q25 Text Solution:

(1)

2.653×10^4	4
1.00368	6
65.4	3
0.36	2

Q26 Text Solution:

(D)

The number of O atoms in 1 g of O_2 =

$\frac{1}{32} \times 2 \times N_A = \frac{N_A}{16}$

The number of O atoms in 1 g of O_3 =

$\frac{1}{48} \times 3 \times N_A = \frac{N_A}{16}$

The number of O atoms in 1 g of atomic oxygen

= $\frac{N_A}{16}$

Hence, number of O atoms are same.

1g of O_2, O_3, O: different number of atoms due to different molar masses different moles A and R both true but not directly connected.

Q27 Text Solution:

1 mole $Mg_3(PO_4)_2$ Contain 8 mole of O-atoms.

$\therefore$0.75 mole O-atoms

$= \frac{1}{8} \times 0.4 = 0.05$ mol of Compound

Q28 Text Solution:

$n_{HCOOH} = \frac{2.3}{46} = 0.05$

$n_{H_2C_2O_4} = \frac{4.5}{90} = 0.05$

n_{CO_2} produced = $n_{H_2C_2O_4} = 0.05$

n_{CO} produced = $n_{H_2C_2O_4} + n_{HCOOH}$

= 0.05 + 0.05

= 0.1

$\therefore$ KOH will absorb CO_2

mass of CO(remaining product)

= 0.1 $\times$ 28

= 2.8 g

Q29 Text Solution:

Urea: NH_2CONH_2

Molar mass = 60

% of N = $\frac{28}{60} \times 100$

= 46.66 %

Q30 Text Solution:

$X_{H_2SO_4}$ = 0.1

$\therefore n_{H_2SO_4}$ = 0.1

N_{H_2O} = 0.9

W_{H_2O} = 0.9 x 18 g

Molality = $= \frac{0.1}{0.9 \times 18 \times 10^{-3}} = 6.17\,m$

Q31 Text Solution:

% by mass $= \frac{\text{mass of element}}{\text{molar mass}} \times 100$

$0.1 = \frac{24 \times 100}{\text{minimum molar mass}}$

$\therefore$ minimum molar mass = 24000 u

Q32 Text Solution:

Molarity and density involve volume so affected by temperature.

Q33 Text Solution:

Formula mass is used for NaCl instead fo molecular mass as in solid state NaCl does not exist as single entity.

Q34 Text Solution:

- 2.24 L O_2: $\frac{2.24}{22.4} \times 32 = 3.2g$
- 6.022 × 10^{21} molecules: $\frac{6.022 \times 10^{21}}{6.022 \times 10^{23}} \times 32 = 0.32g$
- 1 g molecule: 1 mole of O_2 = 32 g
- 0.001 mol: 0.001 × 32 = 0.032 g

Q35 Text Solution:

AB_2: 5(a + 2b) = 100

A_2B: 10(2a + b) = 300

on solving; $a = \frac{40}{3} g\ mol^{-1}$

$b = \frac{10}{3} g\ mol^{-1}$

Q36 Text Solution:

Dolton's theory could not explain the laws of gaseous volumes.

Q37 Text Solution:

No. of electron $= \frac{0.6}{60} \times N_A \times 32$

$= 0.32N_A$

Q38 Text Solution:

atomic mass (mass of N_A atoms)

$= \frac{2}{3.011 \times 10^{23}} \times 6.022 \times 10^{23}$

$= 4u$

Q39 Text Solution:

$n_{H^+} = 0.1 \times 200 \times 10^{-3} \times 2 = 4 \times 10^{-2}$

$n_{OH^-} = 0.1 \times 100 \times 10^{-3} \times 1 = 1 \times 10^{-2}$

$H^+ + OH^- \rightarrow H_2O$

n_{H^+} remaining = $4 \times 10^{-2} - 1 \times 10^{-2}$

$= 3 \times 10^{-2}$

$[H^+]_{final} = \frac{3 \times 10^{-2}}{300 \times 10^{-3}} = 0.1M$

Q40 Text Solution:

$M = \frac{\%\ \text{by mass} \times d(g/m) \times 10}{\text{molar mass}}$

$5 = \frac{31.5 \times d \times 10}{63}$

$d = \frac{5 \times 63}{31.5 \times 10} = 1\ g\ mL^{-1}$

Q41 Text Solution:

$M_2CO_3 + 2HCl \rightarrow 2MCl + CO_2 + H_2O$

$n_{M_2CO_3} = n_{CO_2}$

$\frac{2}{2M+60} = 0.01$

$\therefore M = 70\ g\ mol^{-1}$

Q42 Text Solution:

Average atomic mass $= \frac{40\times10+42\times80+44\times10}{100}$ = 42

Q43 Text Solution:

N_2 + $3H_2 \rightarrow 2NH_3$

1 mol 3 mol

1×28g 3×2g

28g 6g

∴ for 6g H_2 only 10g N_2 is present (LR) in option (B).

Q44 Text Solution:

Molality of $Na^+ = \frac{\left(\frac{69}{23}\right)}{1}$

= 3 m

∴ molality of Na_2SO_4 =$\frac{3}{2} = 1.5m$

Q45 Text Solution:

mass of acetic acid adsorbed

= (0.04 – 0.02) × 100 × 10^{-3} × 60g

= 0.12 g

Mass adsorbed per gram of charchoal

$= \frac{0.12}{2} = 0.06g$

Q46 Text Solution:

$n_i = n_f$ (CH_3OH)

$\frac{0.8\times v}{32\times10^{-3}} = 2.5 \times 0.25$

$V = 25 \times 10^{-3}L$

$= 25\,mL$

Q47 Text Solution:

$M_1V_1=M_2V_2$

0.2 × 100 = 0.15 × V_2

V_2 = 133.33 mL

volume of H_2O required = 133.33 – 100 = 33.33 mL

Q48 Text Solution:

At STP, 5.6 L of gas = 11g

∴ 22.4 L (1 mol) of gas = 44g (Molar mass)

Q49 Text Solution:

Mass of one molecule

$= \frac{molar\ \ mass}{N_A}$

$= \frac{28}{N_A}g$

Q50 Text Solution:

$n_C = \frac{81.82}{12} = 6.82$

$n_H = \frac{100-81.82}{1} = 18.18$

$\therefore \frac{n_C}{n_H} = \frac{6.82}{18.18} = \frac{1}{2.66} = \frac{3}{8}$

∴ empirical formula = C_3H_8