CHEMISTRY

AAKASH INSTITUTE ENGLISH

SOME BASIC CONCEPT OF CHEMISTRY

Example

1. Classify the following as pure substances or mixtures, give reasons.

(i) Graphite (ii) Milk

(iii) Air (iv) Diamond

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2. Identify the following as homogeneous and heterogeneous mixture.

(i) Aerated drinks (ii) Brass

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3. Express the following in scientific notation.

(1) 175000

(2) 0.17

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4. Express the following mathematical operations in scientific notation.

(1) $\left(6.6 \times 10^{5}\right) \times \left(7.7 \times 10^{9}\right)$

(2) $\left(6.6 \times 10^{5}\right) \times \left(7.7 \times 10^{-7}\right)$

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5. Express the following mathematical operations in scientific notation

(1) $\dfrac{7.7 \times 10^{9}}{6.6 \times 10^{5}}$

(2) $\dfrac{7.7 \times 10^{-7}}{6.6 \times 10^{5}}$

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6. Express the following mathematical operations in scientific notation

(1) $\left(7.7 \times 10^4\right) + \left(0.77 \times 10^5\right)$

(2) $\dfrac{8.7 \times 10^4}{0.77 \times 10^5}$

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7. Express the following numbers to four significant figures.

(1) 6.608792 (2) 42.392800

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8. In a second order reaction 20% of a substance is dissociated in 40 min. The time taken by 80% of its dissociation is :

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9. What is the sum of 3.368 kg and 2.02 kg ?

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10. The mass of wood block is 6.932 g. If density of wood is $7.7g/cm^3$, what is its volume ?

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11. The volume of a body having density $1gcm^{-3}$ and mass 100 g is _____ cm^3.

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12. 10.0 g of $CaCO_3$ on heating gave 4.4 g of CO_2 and x g of CaO. Applying law of conservation of mass calculate the mass of CaO.

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13. Copper oxide was prepared by two different methods. In case, 1.75 g of the metal gave 2. 19 g of oxide. In the second case, 1.14 g of the metal gave 1.43 g of the oxide, show that the given data illustrate the law of constant proportions.

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14. Hydrogen and oxygen are known to form two compounds. The hydrogen content in one of these is 5.93% while in the other it is 11.2%. Show that this data illustrates the law of multiple proportions.

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15. (i) How would you define the terms atomic mass and molecular mass ?

(ii) Nitrogen occurs in nature in the form of two isotopes with atomic masses 14 and 15 respectively. If the average atomic mass of nitrogen is 14.0067, what is the percent abundance of the two isotopes ?

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16. Calculate mass of one atom of nitrogen in gram.

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17. Calculate mass of one molecule of methane (CH_4)

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18. How many moles of H, are present in 4.9 g H_2SO_4 ?

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19. Fil in the blanks

a. The mass of 1 molecule of water (H_2O) is .....

b. The number of molecules in $16g$ of sulphur dioxide

(SO_2) are .....

c. The weight of one mole of sodium carbonate (Na_2CO_3) is.....

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20. Calculate the number of atoms in

(1) 1 mole of nitrogen N_2

(2) 1 mole of phosphorous molecules P_4.

(3) 0.05 g of water

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21. Calculate the number of molecules in 1 ml of O_2 at NTP.

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22. Calculate the volume occupied at NTP by (i) 2.5 mole of carbon dioxide (ii) 14 g of nitrogen gas

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23. Calculate the number of ions, number of oxygen atom and total charge in 3 gm CO_3^{2-}

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24. Calculate the mass of 2.5 g atom of oxygen.

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25. Calculate number of molecules in 1 ml of Co_2 at NTP.

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26. Calculate number of atoms in 3 mol of NH_3

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27. An enzyme contains 5.6% Fe, calculate number of Fe atoms present in 1g of enzyme.

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28. The equivalent weight of potash alum $\left(K_2SO_4.\ Al_2(SO_4)_3.24H_2O\right)$ is

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29. What is the equivalent weight of hydride of metal if equivalent weight of its oxide is 20?

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30. Calculate equivalent weight of H_3PO_4 and $Ca(OH)_2$ on the basis of given reaction.

$H_3PO_4 + NaOH \rightarrow NaH_2PO_4 + H_2O$

$Ca(OH)_2 + HCL \rightarrow Ca(OH)CL + H_2O$

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31. Find the percentage of calcium in calcium carbonate $(CaCO_3)$.

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32. What is the simplest formula of the compound which has the following percentage composition - Carbon 80%. Hydrogen 20% ? If the molecular mass is 30, calculate its molecular formula.

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33. A compound on analysis gave the follwing result C=54.54%, H=9.09% and vapour density of compound = 88.Determine the molecular formula of the compound.

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34. An inorganic substance on analysis gave the following results Na = 29.1%, S = .40.5% and O = 30.4%. Calculate its empirical formula.

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35. How many gram of oxygen (O_2) is required to completely react with 0.200 g of hydrogen (H_2) to yield water (H_2O) ? Also calculate the amount of water formed (molecular mass H = 2, O = 32).

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36. How much magnesium sulphide can be obtained from $2.00g$ of Mg and $2.00g$ of S by the reaction. $Mg + S \rightarrow MgS$. Which is the limiting reagent? Calculate the amount of one of the reactants which remains unreacted?

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37. Calculate volume of carbon dioxide produoed on heating 10 g of limestone at S.T.P.

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38. Calculate number of moles of Na2so4 produced from 1 mole of NaOH

$$2NaOH + H_2SO_4 \rightarrow NaSO_4 + 2H_2O$$

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39. Calculate mass of CO_2 produced by heating 40 g of 20% pure limestone,

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40. How many moles of lead nitrate is needed to produce 224 litre of oxygen at NTP?

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41. The solubility of K_2SO_4 in water is 16 g at $50^\circ C$. The minimum amount of water required to dissolve 4 g K_2SO_4 is:

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42. A solution is prepared by adding 5 g of a substance x to 18 g of water. Calculate the mass percent of the solute.

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43. A solution is prepared by adding 360 g of glucose to 864 g of water. Calculate mole fraction of glucose (molar mass of glucose = 180).

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44. A given solution of NaOH contains 4.00 g of NaOH per litre of solution. Calculate the molarity of this solution.

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45. A solution is prepared by dissolving 1.0g of NaOH in water to get 250 ml of solution. Calculato its molarity.

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46. How many moles and how many grams of HCI are present in 250 ml of 0.5 M HCl solution?

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47. 1.26 g of hydrated oxalic acid was dissolved in water to prepare 250 ml of solution. Calculate

molarity of solution

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48. A solution contains 10 moles of sucrose in 1 kg of solvent. Calculate the molality of solution.

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49. Calculate the molality of a solution containing 5.3 g of anhydrous Na_2CO_3 in 400 g of water,

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50. How many gram equivalents of H_2SO_4 are present in 200 ml of $\frac{N}{10}H_2SO_4$ solution?

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51. 100 ml decinormal HCl is mixed to 100 ml seminormal H_2SO_4 solution. Calculate normality of resulting mixture

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52. $200ml\frac{N}{10}$ H_2SO_4 is mixed into $300ml\frac{N}{100}NaOH$. Calculate normality of resulting

mixture.

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Try Yourself

1. Identify the following as homogeneous and heterogeneous mixtures.

(i) Sugar dissolved in water.

(ii) Oil and water

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2. Identify the following as homogeneous and heterogeneous mixtures.

(i) Alcohol and water

(ii) Sand and iron filings

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3. Consider the following equation

$Ca(OH)_2 + H_3PO_4 \rightarrow CaHPO_4 + 2H_2O$

The equivalent mass of phosphoric acid(H_3PO_4) is

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4. A solution is prepared by dissolving 18.25 g NaOH in 200 mL of it. Calculate the molarity of the solution.

5. Predict the major product formed when sodium ethoxide reacts with tert.Butyl chloride ?

6. Express the following numbers to three significant figures.

(i) 6.022×10^{23}

(ii) 44.216

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7. What is the sum of 5.228 kg and 1.02 kg ? Express the result to the appropriate significant figures .

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8. Perform the following calculations to the appropriate number of signficiant digits

$$\frac{6.02 \times 10^{23} \times 4.00}{4.0 \times 10^{20}}$$

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9. When 8.4 g of $NaHCO_3$ is added to a solution of CH_3COOH weighing 20g, it is observed that 4.4 g of CO_2 is released into atmosphere and a residue is left behind. Calculate the mass of residue by applying law of conservation of mass.

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10. If 12.6 g of $NaHCO_3$ are added to 30.0 g of CH_3COOH solution, the residue is found is found

to weight 36.0 g. What is the mass CO_2 released in the reaction ?

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11. 2,75 g of cupric oxide was reduced by heating in a current of hydrogen and the weight of copper that remained was 2.196 g. Another experiment, 2.358 g of copper was dissolved in nitric acid and the resulting copper nitrate converted into cupric oxide by ignition. The weight of cupric oxide formed was 2.952 g. Show that these results illustrate law of constant composition.

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12. The activation energy of a gas reaction is 30 kcal/mol in the temperature range $0^{\circ} C$ to $60^{\circ} C$. The temperature coefficient of the reaction is :

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13. On analysis it was found that the black oxide of copper and red oxide of copper contain 80% and 89% of copper respectively. Show that this data is in accordance with law of multiple proportions.

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14. Sulphur and oxygen are known to form two compounds. The sulphur content in one of these is 51 % while in the other is 41 %. Show that this data is in agreement with the law of multiple proportions.

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15. Boron has two isotopes, B-10 and B-11. The average atomic mass of boron is found to be 10.80u. Calculate the percentage of abundance of these isotopes.

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16. Carbon found nature as a mixture of C-12 and C-13. The average atomic mass of carbon is 12.011u. What is the percentage abundance of carbon-12 in nature ?

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17. What will be the weight of CO having the same number of oxygen atoms as present in 22 g of CO_2?

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18. What is the molecular mass of substance, each molecule of which contains 4 atoms of carbon and 10

atoms of hydrogen?

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19. How many molecules of O_2 are present in 1 L air containing 80% volume of O_2 at STP?

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20. Calculate the volume occupied by (i) 28 u nitrogen gas (ii) 28 g N_2 gas at STP.

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21. Calculate percentage of sulphur in sulphuric acid (H_2SO_4).

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22. Calculate percentage of carbon in ethanol (C_2H_5OH).

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23. A substance on analysis, gave the following percentage composition : Na = 43.4 %, C = 11.3%, O =

45.3 %. Calculate the empirical formula. (Na = 23, C = 12, O = 16).

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24. A compound gave the following data:

$C = 57.82\,\%$, $0 = 38.58\,\%$ and the rest hydrogen. Its relative molecular mass is 166. Find its empirical formula and molecular formula.

$[C = 12, 0 = 16, H = 1]$

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25. Calculate the amount of water (g) produced by the combustion of 16 g of methane

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26. How many moles of methane are required to produce 22 g of CO_2 on combustion?

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27. 50.0 kg of N_2 (g) and 10.0 kg of H_2 (g) are mixed to produce NH_3 (g). Calculate the amount ofNH_3

(g) formed. Identify the limiting reagent in the production of NH3 in this situation

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28. 80 g of H_2 is reacted with 80 g of O_2 to form water. Find out the mass of water obtained. Which substance is the limiting reagent ?

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29. A given solution of NaOH contains 200 g of NaOH per litre of solution. Calculate the molarity, of this solution.

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30. How many moles of HCl are present in 1 litre of 1 M HCl solution ?

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Exercise

1. One day is equal to

A. $24 \times 60 \times 60S$

B. $24 \times 60S$

C. $24 \times 50 \times 60S$

D. $24 \times 100 \times 60S$

Answer: A

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2. Write the SI unit of luminous intensity and the amount of substance.

A. kg

B. mole

C. candela

D. ampere

Answer: C

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3. What is the unit of frequency ?

A. hertz

B. second^{-1}

C. min^{-1}

D. All of these

Answer: D

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4. How many significant figures are in 0.0005?

A. 1

B. 2

C. 3

D. 4

Answer: A

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5. The number of significant figures in 1.0001 are

A. 1

B. 2

C. 4

D. 5

Answer: D

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6. Add (0.001 +0.02) upto correct number of significant figures

A. 0.021

B. 0.02

C. 0.003

D. 0.001

Answer: B

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7. The multiple 5×0.2 after rounding off will be

A. 1

B. 1.0

C. 1.00

D. 1.000

Answer: A

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8. Round off 0.1525 upto three significant figures

A. 0.153

B. 0.152

C. 0.16

D. 0.15

Answer: B

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9. Round off 0.1576 upto one digit after decimal

A. 0.1

B. 1.6×10^{-1}

C. 0.2

D. 1.6

Answer: C

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10. The value of $\frac{5.86 \times 3.96}{2.86}$ will be equal to

A. 8

B. 8.11

C. 8.1

D. 8.113

Answer: C

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11. The percentage of hydrogen in water and hydrogen peroxide is 11 .1 and 5.9 respectively . These figures illustrate

A. Law of multiple proportions

B. Law of conservation of mass

C. Law of constant proportions

D. Law of combining volumes

Answer: A

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12. Element X forms five stable oxides with oxygen of formula X_2O, XO, X_2O_3, X_2O_5 . The formation of these oxides explains

A. Law of definite proportions

B. Law of partial pressures

C. Law of multiple proportions

D. Law of reciprocal proportions

Answer: C

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13. Which of the following represents Avogadro's hypothesis ?

A. Gases react together in volumes which bear a simple ratio to one another

B. Equal volumes of all gases under same conditions of temperature and pressure contain equal number of molecules

C. Equal volumes of all gases under same conditions of temperature and pressure contain equal number of atoms

D. The rates of diffusion of gases are inversely proportional to the square root of their densities

Answer: B

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14. When 200 g of lime strongly heated , it undergoes thermal decomposition to form 112 g of lime and unknown mass of carbon dioxide gas as

$$\underset{200g}{CaCO_3} \rightarrow \underset{112g}{CaO} + \underset{?}{CO_2}$$

What will be the mass of CO_2 formed ?

A. 88 g

B. 24 g

C. 64 g

D. 40 g

Answer: A

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15. Carbon and oxygen react in ratio 3 : 8 by mass to form CO_2 . What weight of carbon should be used to react completely with 32 g of oxygen ?

A. 10 g

B. 15 g

C. 12 g

D. 7g

Answer: C

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16. Cu forms two oxides cuprous and cupric oxides, which law can be proved by the weights of Cu and O?

A. Constant composition

B. Multiple proportions

C. Reciprocal proportions

D. Definite proportions

Answer: B

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17. The law of conservation of mass holds good for all of the following except.

A. All chemical reactions

B. Nuclear reactions

C. Endothermic reactions

D. Exothermic reaction

Answer: B

18. Equal volumes of all gases under similar conditions of temperature and pressure contain equal number of atoms.

A. Equal atoms

B. Equal masses

C. Equal densities

D. Equal molecules

Answer: D

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19. Which of the following pair of compounds illustrate the law of multiple proportions?

A. KOH, CsOH

B. H_2O, D_2O

C. Ethane, benzene

D. KCl, KBr

Answer: C

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20. Gay Lussac's law is not valid in the chemical reaction:

A. $H_2(g) + Cl_2(g) \rightarrow 2HCI(g)$

B. $3H_2(g) + N_2(g) \rightarrow 2NH_3(g)$

C. $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$

D. $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

Answer: D

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21. Atomic weight of chlorine is 35.5 . It has two isotopes of atomic weight 35 and 37 . What is the percentage of the heavier isotope in the sample ?

A. 5

B. 10

C. 15

D. 20

Answer: C

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22. The number of moles of nitrogen atom in 56 g nitrogen is

A. 2 mol

B. 4 mol

C. 8 mol

D. 10 mol

Answer: B

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23. The number of mole of N - atom in $18.066x10^{23}$ nitrogen atoms is

A. 1 mol

B. 2 mol

C. 3 mol

D. 4 mol

Answer: C

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24. What weight in grams is represented by 1.5 moles of sulphur dioxide ?

A. 60 g

B. 74g

C. 96 g

D. 91 g

Answer: C

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25. The number of atoms in 20 g of SO_3 is approximately

A. 1×10^{23}

B. 1.5×10^{23}

C. 2×10^{23}

D. 6×10^{23}

Answer: D

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26. The number of particles presents in 1 mol of nitrogen atom are

A. 6.022×10^{25}

B. 6.022×10^{24}

C. 6.022×10^{23}

D. 6.022×10^{22}

Answer: C

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27. Boron has two stable isotopes, $.^{10}B(19\%)$ and $.^{11}B(81\%)$. The atomic mass that should appear for boron in the periodic table is

A. 10.81

B. 10^5

C. 11

D. 10.5

Answer: A

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28. Calculate the mass of 1 amu in grams.

A. $1.66x10^{24}$

B. $1.66x10^{-24}$

C. 1.008

D. 9.1×10^{-28}

Answer: B

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29. One 'u' stands for the mass of

A. An atom of carbon-12

B. 1/12th of the carbon-12

C. 1/12th of hydrogen atom

D. One atom of any of the elements

Answer: B

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30. What is the mass of one molecule of water in grams?

A. $3 \times 10^{-23} g$

B. 18g

C. $1.5 \times 10^{-23} g$

D. $4.5 \times 10^{-23} g$

Answer: A

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31. $74.5g$ of a metallic chloride contain $35.5g$ of chlorine. The equivalent weight of the metal is

A. 74.5

B. 39

C. 35.5

D. 7.45

Answer: B

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32. Two element X (at . Mass = 75) and Y(at .mass =16) combine to given a compound having 75.8% of X. The formula of the compound is :

A. XY

B. X_2Y

C. X_2Y_2

D. X_3Y_3

Answer: D

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33. Equivalent weight of crystalline oxalic acid is

A. 90

B. 63

C. 53

D. 45

Answer: B

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34. Find out the equivalent weight of H_3PO_4 in the reaction:

$$Ca(OH)_2 + H_3PO_4 \rightarrow CaHPO_4 + 2H_2O$$

A. $\frac{M}{1}$

B. $\frac{M}{2}$

C. 2M

D. $\frac{M}{4}$

Answer: B

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35. Equivalent mass of a metal is 12 g mol^{-1}. Hence, equivalent mass of its oxide is

A. 24

B. 28

C. 20

D. 34

Answer: C

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36. The percentage of nitrogen in HNO_3 is

A. 0.2222

B. 0.35

C. 0.2857

D. 0.45

Answer: A

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37. What is the ratio of empirical formula mass to molecular formula mass of benzene?

A. 1:6

B. 2:3

C. 6:1

D. 3:2

Answer: A

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38. The compound in which mass percentage of carbon is 75% and that of hydrogen is 25% is

A. C_2H_6

B. C_2H_2

C. CH_4

D. C_2H_4

Answer: C

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39. Identify the molecule having empirical formula CH_2O

A. CH_3CHO

B. $HO - CH_2 - CH_2 - OH$

$COOH$

C. |

$COOH$

D. CH_3COOH

Answer: D

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40. 4 g of a metal oxide contains 1.6 g-oxygen, then equivalent mass of the metal is

A. 3.2

B. 24

C. 12

D. 20

Answer: C

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41. 8 gm H_2 and $32gmO_2$ is allowed to recant to form water then which of the following statement is correct ?

A. O_2 is limiting reagent

B. O_2 is reagent in excess

C. H_2 is limiting reagent

D. 40 g water is fomed

Answer: A

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42. Equal volume of N_2 and H_2 react to form ammonia under suitable condition then the limiting reagent is

A. H_2

B. N_2

C. NH_3

D. No one reactant is limiting reagent

Answer: A

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43. How many grams of calcium oxide is obtained on heating 100 g of $CaCO_3(s)$?

A. 50 g

B. 40 g

C. 56 g

D. 44 g

Answer: C

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44. The volume of O_2 at STP required for the complete combustion of 4 g CH_4 is

A. 5.6 litre

B. 2.88 litre

C. 22.4 litre

D. 11.2 litre

Answer: D

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45. 0.9 g Al reacts with dil. HCl to give H_2. The volume of H_2 evolved at STP is (Atomic weight of Al = 27)

A. 1.12 litre

B. 2.24 litre

C. 3.33 litre

D. 4.44 litre

Answer: A

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46. Which of the following statement is correct?

A. 28 g CO contains 12 g carbon and 16 g oxygen

B. One mole of CO reacts completely with half mole of O_2 to form CO_2

C. N_2 and Co have same molar mass

D. All of these

Answer: D

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47. Calcium carbonate decomposes on heating according to the following equations:

$CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$

How many moles of CO_2 will be obtained by decomposition of 50g of $CaCO_3$?

A. $\frac{3}{2}$

B. $\frac{5}{2}$

C. $\frac{1}{2}$

D. 1

Answer: A

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48. Limiting reagent in a chemical reaction is that reactant which

A. Left some amount unreacted after the completion of reaction

B. Reacts completely in the reaction

C. Does not react in the reaction

D. All of these

Answer: B

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49. What is the mass of glucose required to produce 44 g of CO_2, on complete combustion?

A. 30 g

B. 45 g

C. 60 g

D. 22 g

Answer: A

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50. 10g of MnO_2 on reactoin with HCI forms 2.24 L of $Cl_2(g) at NTP_1$ the percentage impurity of $MnO_2 is: -MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

A. 87%

B. 25%

C. 33.03%

D. 13%

Answer: D

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51. Molality is expressed in units of

A. $molkg^{-1}$

B. $molL^{-1}$

C. $molL^{-1}s^{-1}$

D. $molg^{-1}s^{-1}$

Answer: A

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52. Which of the following is correct?

A. The sum of mole fractions of all the components in a solution is always unity

B. Mole fraction depends upon temperature

C. Mole fraction is always negative

D. Mole fraction is independent of content of solute in solution

Answer: A

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53. Which of the following methods of expressing concentration varies with temperature ?

A. Molality

B. Weight percent

C. Molarity

D. Mole fraction

Answer: C

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54. What is the molarity of NaOH solution if 250 mL of it contains 1 mg of NaOH ?

A. $10^{-1}M$

B. $10^{-2}M$

C. $10^{-4}M$

D. $10^{-3}M$

Answer: C

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55. How many grams of NaOH are present in 250 mL of 0.5 M NaOH solution ?

A. 0.125 mol

B. 0.150 mol

C. 0.075 mol

D. 0.02 mol

Answer: A

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56. A 5 M solution of H_2SO_4 is diluted from 1 litre to a volume of 100 litres, the normality of the solution will be

A. 1N

B. 5N

C. 0.1 N

D. 0.5 N

Answer: C

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57. If 100 mL of $1NH_2SO_4$ is mixed with 100 mL of 1 M NaOH solution. The resulting solution will be

A. Highly acidic

B. Neutral

C. Highly basic

D. Slightly acidic

Answer: B

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58. 27 g of Al will react completely with ..... g of O_2.

A. 24 g

B. 8 g

C. 40 g

D. 10 g

Answer: A

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59. 12 g of Mg (at. Mass 24) will react completely with acid to give

A. 0.5 mol of H_2

B. 1.5 mol of H_2

C. 1.5 g of H_2

D. 0.5 g of H_2

Answer: A

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60. Volume at NTP of oxygen required to completely burn 1 kg of coal (100% carbon)

A. 22400 L

B. $22.4 \times 10^3 L$

C. $1.86 \times 10^3 L$

D. 1000L

Answer: C

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Assignment Section A Objective Type Questions

1. A sample of ammonium phosphate $(NH_4)_3PO_4$ contains 3.18 moles of hyrogen atoms . The number of moles of oxygen atoms in the sample is

A. 0.265

B. 0.795

C. 1.06

D. 4

Answer: C

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2. Two oxides of a metal contain 27.6% and 30.0% of Oxygen, respecttively. If the formula of the first be M_3O_4. Find that of the second.

A. XO

B. XO_2

C. X_2O_5

D. X_2O_3

Answer: D

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3. Calculate the molality of solution containing 3 g glucose dissolved in 30 g of water . (molar mass of glucose = 180)

A. 0.50 m

B. 0.56 m

C. 0.091 m

D. 0.05 m

Answer: B

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4. An element , X has the following isotopic composition :

ˆ $(200)X: 90\,\%, {}^{199}X: 8.0\,\%, {}^{202}X: 2.0\,\%$ The weighted average atomic mass of the naturally occurring element X is closest to naturally occurring element X is closest to

A. 201 amu

B. 202 amu

C. 199 amu

D. 200 amu

Answer: D

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5. Which has the maximum number of molecules among the following?

A. $8gH_2$

B. $64gSO_2$

C. $44gCO_2$

D. $48gO_3$

Answer: A

Watch Video Solution

6. What volume of oxygen gas (O_2) measured at $0^\circ C$ and 1 atm , is needed to burn completely 1L of propane gas (C_3H_8) measured under the same conditions ?

A. 10 L

B. 7L

C. 6 L

D. 5L

Answer: D

Watch Video Solution

7. What is the volume of one molecules of water (density of $H_2O = 1gcm^{-3}$)

A. $5.5 \times 10^{-23} cm^3$

B. $9.0 \times 10^{-23} cm^3$

C. $6.023 \times 10^{-23} cm^3$

D. $3.0 \times 10^{-23} cm^3$

Answer: D

Watch Video Solution

8. The total number of electrons in 1.6 g of CH_4 to that in 1.8 g of H_2O

A. Double

B. Same

C. Triple

D. One fourth

Answer: B

Watch Video Solution

9. When x molecules are removed from 200 mg of N_2O. 2.89×10^{-3} moles of N_2O are left. x will be

A. 10^{20} molecules

B. 10^{10} molecules

C. 21 molecules

D. 10^{21} molecules

Answer: D

Watch Video Solution

10. 4 g of hydrogen reacts with 20 g of oxygen to form water. The mass of water formed is

A. 24 g

B. 36 g

C. 22.5 g

D. 40 g

Answer: C

Watch Video Solution

11. Which has maximum number of molecules?

A. $7gN_2O$

B. $20gH_2$

C. $16gNO_2$

D. $16gSO_2$

Answer: B

Watch Video Solution

12. The number of atoms in 4.25 g of NH_3 is approximately

A. 4×10^{23}

B. 1.5×10^{23}

C. 1×10^{23}

D. 6×10^{23}

Answer: B

Watch Video Solution

13. The maximum number of molecules are present in

A. 15 L of H_2 gas at STP

B. 5 L of N_2 gas at STP

C. 0.5 g of H_2 gas

D. 10 g of O_2 gas

Answer: A

Watch Video Solution

14. The number of atoms in 0.1 mol of a tetraatomic gas is ($N_A = 6.02 \times 10^{23} mol^{-1}$)

A. 2.4×10^{22}

B. 6.026×10^{22}

C. 2.4×10^{23}

D. 3.600×10^{23}

Answer: C

Watch Video Solution

15. How many grams of NaOH should be added to water to prepare 250 ml solution of 2 M NaOH?

A. 9.6×10^{3}

B. 2.4×10^{3}

C. 20

D. 24

Answer: C

Watch Video Solution

16. Haemoglobin contains 0.33% of iron by weight . The molecular weight of heamoglobin is approximately 67200 g . The number of iron atoms (at . Weight of Fe is 56) present in one molecule of heamoglobin are

A. 4

B. 6

C. 3

D. 2

Answer: A

Watch Video Solution

17. In the reaction, $2SO_2 + O_2 \rightarrow 2SO_3$ when 1 mole of SO_2 and 1 mole of O_2 are made to react to completion

A. All the oxygen will be consumed

B. 1.0 mole of SO_3 will be produced

C. 0.5 mole of SO_2 is remained

D. All of these

Answer: B

Watch Video Solution

18. If the weight of metal chloride is x gm containing y gm of metal, the equivalent weight of metal will be :-

A. $E = \frac{x}{y} \times 35.5$

B. $E = \frac{8(y-x)}{x}$

C. $E = \frac{y}{x-y} \times 35.5$

D. $E = \frac{8(x-y)}{y}$

Answer: C

 Watch Video Solution

19. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded . Amount of water produsedin this reaction will be

A. 1 mol

B. 2 mol

C. 3 mol

D. 4 mol

Answer: D

Watch Video Solution

20. Sulphur trioxide is preapared by the following two reactions:

$S_8(s) + 8O_2(g) \rightarrow 8SO_2(g)$

$2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$

How many grams of SO_3 are produced from 1 mole fo S_8?

A. 1280 g

B. 960 g

C. 640 g

D. 320 g

Answer: C

Watch Video Solution

Assignment Section B Objective Type Questions

1. The total number of electrons in 4.2 g of N^{3-} ion is (N_A is the Avogadro's number)

A. $2.1N_A$

B. $4.2N_A$

C. $3N_A$

D. $3.2N_A$

Answer: C

Watch Video Solution

2. The number of mole of nitrogen in one litre of air containing 10% nitrogen by volume, under standard conditions, is

A. 0.03 mole

B. 2.10 mole

C. 0.186 mole

D. 4.46×10^{-3}mole

Answer: D

Watch Video Solution

3. Liquid benzene $C_6H_6)$ burns in oxygen according to the equation,

$2C_6H_6(l) + 15O_2(g) \rightarrow 12CO_2(g) + 6H_2O(g)$

How many litres of O_2 at STP are needed to complete the combustion of 39 g of liquid benzene ? (Mol . Weight if $O_2 = 32, C_6H_6 = 78)$

A. 74 L

B. 11.2 L

C. 22.4L

D. 84 L

Answer: D

Watch Video Solution

4. One mole of potassium chlorote is thermally decomposed and excess of aluminium is burnt in the gaseous product. How many mole(s) of aluminium oxide are formed?

A. 1

B. 2

C. 1.5

D. 3

Answer: A

Watch Video Solution

5. The amount of zinc required to produce 1.12 ml of H_2 at STP on treatment with dilute HCI will be

A. 65 g

B. 0.065 g

C. $32.5 \times 10^{-4} g$

D. 6.5 g

Answer: C

Watch Video Solution

6. What volume of CO_2 at STP is obtained by thermal decomposition of 20g $KHCO_3$? [Atomic weight of $K = 39 gmol^{-1}$]

$$2KCO_3(s) \longrightarrow K_2O(s) + 2CO_2(g) + H_2O(g)$$

A. 2.24 litre

B. Zero

C. 0.85 litre

D. 0.56 litre

Answer: B

Watch Video Solution

7. One litre of CO_2 is passed over hot coke. The volume becomes $1.4L$. Find the composition of products, assuming measurement at NTP.

A. 0.8 litre of CO_2 and 0.6 litre of CO

B. 0.7 litre of CO_2 and 0.7 litre of Co

C. 0.6 litre of CO_2 and 0.8 litre of Co

D. 0.4 litre of CO_2 and 1.0 litre of CO

Answer: C

Watch Video Solution

8. Suppose that A and B form the compounds B_2A_3 and B_2A if 0.05 mole of B_2A_3 weighs 9 g and 0.1 mole of B_2A weighs 10 g, the atomic weight of A and B respectively are

A. 30 and 40

B. 40 and 30

C. 20 and 5

D. 15 and 20

Answer: B

Watch Video Solution

9. When 100 ml of $\frac{M}{10}H_2SO_4$ is mixed with 500 ml of $\frac{M}{10}NaOH$ then nature of resulting solution and normality of excess of reactant left is

A. Acidic, $\frac{N}{5}$

B. Basic $\frac{N}{5}$

C. Basic $\frac{N}{20}$

D. Acidic $\frac{N}{10}$

Answer: C

Watch Video Solution

10. Mole fraction of solvent in aqueous solution of NaOH having molality of 3 is

A. 0.3

B. 0.05

C. 0.7

D. 0.95

Answer: D

Watch Video Solution

11. Concentrated aqueous sulphuric acid is $98\,\%\,H_2SO_4$ by mass and has a density of $1.80 gm L^{-1}$. Volume of acid required to make one litre of $0.1 M H_2SO_4$ solution is

A. 16.65 mL

B. 22.20 ml

C. 5.55 mL

D. 11.10 ml

Answer: C

Watch Video Solution

Watch Video Solution

12. Number of significant figures in 6.62×10^{-34}

A. Two

B. Three

C. Four

D. One

Answer: B

Watch Video Solution

13. Ammonia gas is passed into water, yielding a solution of density $0.93g/cm^3$ and containing $18.6\,\%\,NH_3$ by weight. The mass of NH3 per cc of the solution is :

A. $0.17g/cm^3$

B. $0.34g/cm^3$

C. $0.51g/cm^3$

D. $0.68g/cm^3$

Answer: A

Watch Video Solution

14. A certain amount of a metal whose equivalent mass is 28 displaces 0.7 L of H_2 at S.T.P. from an acid. Hence, mass of the element is:

A. 1.75 g

B. 0.875 g

C. $0.51g/cm^3$

D. 7.00 g

Answer: A

Watch Video Solution

15. Number of Fe atoms in 100 g Haemoglobin if it contains 0.33% Fe. (Atomic mass of Fe. = 56)

A. 0.035×10^{23}

B. 35

C. 3.5×10^{23}

D. 7×10^{8}

Answer: A

Watch Video Solution

16. An organic compound with C =40 % and H= 6.7% will have the empirical formula

A. CH_4

B. CH_2O

C. $C_2H_4O_2$

D. C_2H_4

Answer: B

Watch Video Solution

17. The number of electrons in 1.6 g of CH_4 is approximately

A. 25×10^{24}

B. 1.5×10^{24}

C. 6×10^{23}

D. 3.0×10^{24}

Answer: C

Watch Video Solution

18. 6.025×10^{20} molecules of acetic acid are present in 500 ml of its solution. The concentration of solution is

A. 0.002 M

B. 10.2 M

C. 0.012 M

D. 0.001 M

Answer: A

Watch Video Solution

19. How many litre of oxygen at STP is required to burn 60 g C_2H_6?

A. 22.4L

B. 11.21

C. $22.4 \times 7L$

D. 8.5 L

Answer: C

Watch Video Solution

20. For the formation of 3.65g of HCI gas , what volume of hydrogen gas and chlorine gas , are required at NTP conditions?

A. 1 L, 1L

B. 1.12 L, 2.24

C. 3.65 L, 1.83 L

D. 1.12 L, 1.12 L

Answer: D

Watch Video Solution

21. Specific volume of cylindrical virus particle is $6.02 \times 10^{-2} cc/g$, whose radius and length are 7Å and 10Å respectively . If $N_A = 6.023 \times 10^{23}$, find molecular weight of virus.

A. 15.4 kg/mol

B. $1.54 \times 10^4 kg/mol$

C. $3.08 \times 10^4 kg/mol$

D. $3.08 \times 10^3 kg/mol$

Answer: A

Watch Video Solution

22. The crystalline salt $Na_2SO_4.xH_2O$ on heating loses 55.9 % of its weight. The formula of the crystalline salt is

A. $Na_2SO_4, 5H_2O$

B. $Na_2SO_4, 7H_2O$

C. $Na_2SO_4, 2H_2O$

D. $Na_2SO_4, 10H_2O$

Answer: D

Watch Video Solution

Assignment Section C Previous Years Questions

1. Suppose elements X and Y combine to form two compounds XY_2 and X_3Y_2 when 0.1 mole of former weigh $10g$ while 0.05 mole of the latter weigh $9g$. What are the atomic weights of X and Y.

A. 40, 30

B. 60.4

C. 20, 30

D. 30, 20

Answer: A

Watch Video Solution

2. What is the mass of precipitate formed when 50 mL of $16.9\,\%$ solution of $AgNO_3$ is mixed with 50 mL of $5.8\,\%$ NaCl solution?

(Ag=107.8,N=14,O=16,Na=23,Cl=35.5)

A. 7 g

B. 14 g

C. 28 g

D. 3.5 g

Answer: A

Watch Video Solution

3. If Avogadro number N_A is changed from $6.022 \times 10^{23} mol^{-1}$ to $6.022 \times 10^{20} mol^{-1}$, this would change:

A. The ratio of chemical species to each other in a balanced equation

B. The ratio of elements to each other in a compound

C. The definition of mass in units of grams

D. The mass of one mole of carbon

Answer: D

 Watch Video Solution

4. 20.0g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide . What will be the perpentage purity of magnesium carbonate in the sample ? (Atomic weight of Mg=24)

A. 60

B. 84

C. 75

D. 96

Answer: B

Watch Video Solution

5. A mixture of gases contains H_2 and O_2 gases in the ratio $1:4(w/w)$. What is the molar ratio of the gases in the mixture?

A. 2:1

B. 1 : 4

C. 4:1

D. 16:1

Answer: C

Watch Video Solution

6. 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. $O_2 0.28 g$

Answer: A

Watch Video Solution

7. When $22.4L$ of $H_2(g)$ is mixed with 11.2 L of $Cl_2(g)$, each at STP, the moles of HCl(g) formed is equal to

A. 1 mol of HCI (g)

B. 2 mol of HCI (g)

C. 0.5 mol of HCI (g)

D. 1.5 mol of HCI (g)

Answer: A

 Watch Video Solution

8. 6.02×10^{20} molecules of urea are present in 100 mL of its solution. The concentration of urea solution is:

A. 0.01 M

B. 0.001 M

C. 0.1 M

D. 0.02 M

Answer: A

 Watch Video Solution

9. How many grams of concentrated nitric acid solution should be used to prepare 250 mL of 2.0 M HNO_3 ? The concentrated acid is $70\,\%\ HNO_3$.

A. 90.0 g conc. HNO_3

B. 70.0 g conc. HNO_3

C. 54.0 g conc. HNO_3

D. 45.0 g conc. HNO_3

Answer: D

Watch Video Solution

10. The mole fraction of the solute in one molal aqueous solutions is

A. 1.77

B. 0.177

C. 0.0177

D. 0.0344

Answer: C

Watch Video Solution

11. Which has the maximum number of molecules among the following?

A. $8gH_2$

B. $64gSO_4$

C. $44gCO_2$

D. $48gO_3$

Answer: A

Watch Video Solution

12. The number of atoms in 0.1 mole of a triatomic gas is $\left(N_A = 6.02 \times 10^{23} \text{mol}^{-1}\right)$

A. 6.026×10^{22}

B. 1.806×10^{23}

C. 3.600×10^{23}

D. 1.800×10^{22}

Answer: B

Watch Video Solution

13. 25.3 g of sodium carbonate, Na_2CO_3 is dissolved in enough water to make 250 mL of solution. If sodium carbonate dissociates completely, molar concentration of sodium ion, Na^+ and carbonate ion, CO_3^{2-} are respectively (Molar mass of $Na_2CO_3 = 106gmol^{-1}$)

A. 0.955 M and 1.910 M

B. 1.910 M and 0.955 M

C. 1.90 M and 1.910 M

D. 0.477 M and 0.477 M

Answer: B

Watch Video Solution

14. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded . Amount of water produsedin this reaction will be

A. 3 mol

B. 4 mol

C. 1 mol

D. 2 mol

Answer: B

Watch Video Solution

15. How many moles of lead (II) chloride will be formed from a reaction between 6.5 g of PbO and 3.2 g of HCl?

A. 0.029

B. 0.044

C. 0.333

D. 0.011

Answer: A

Watch Video Solution

16. What is the volume of one molecules of water (density of $H_2O = 1gcm^{-3}$)

A. $5.5 \times 10^{-23} cm^3$

B. $9.0 \times 10^{-23} cm^3$

C. $6.023 \times 10^{-23} cm^3$

D. $3.0 \times 10^{-23} cm^3$

Answer: D

Watch Video Solution

17. What volume of oxygen gas (O_2) measured at $0^\circ C$ and 1 atm , is needed to burn completely 1L of propane gas (C_3H_8) measured under the same conditions ?

A. 10 L

B. 7L

C. 6 L

D. 5 L

Answer: D

Watch Video Solution

18. An organic compound contains carbon , hydrogen and oxygen . Its elemental analysis gave C ,38.41% and $H, 9.67\%$. The empirical formula of the compound would be

A. CH_4O

B. CH_3O

C. CH_2O

D. CHO

Answer: B

Watch Video Solution

19. An element , X has the following isotopic composition :

$\hat{}\ (200)X : 90\ \%\ ,^{199}X : 8.0\ \%\ ,^{202}X : 2.0\ \%$ The weighted average atomic mass of the naturally occurring element X is closest to naturally occurring element X is closest to

A. 199 amu

B. 200 amu.

C. 201 amu

D. 202 amu

Answer: B

Watch Video Solution

20. Concentrated aqueous sulphuric acid is $98\,\%\,H_2SO_4$ by mass and has a density of $1.80 gmL^{-1}$. Volume of acid required to make one litre of $0.1M H_2SO_4$ solution is

A. 5.55 mL

B. 11.10 ml

C. 16.65 mL

D. 16.65 mL

Answer: A

Watch Video Solution

21. How much grams of CH_3OH should be dissolved in water for preparing 150 ml of 2.0 M CH_3OH solution ?

A. 9.6×10^3

B. 2.4×10^3

C. 9.6

D. 2.4

Answer: C

Watch Video Solution

22. The total number of valence electrons in $4.2g$ of N_3^- ion are :

A. $2.1N_A$

B. $4.2N_A$

C. $1.6N_A$

D. $3.2N_A$

Answer: C

Watch Video Solution

23. The number of moles of oxygen in 1 L of air containing 21% oxygen by volume , under standard conditions , is

A. 0.0093 mole

B. 2.10 moles

C. 0.186 mole

D. 21 mole

Answer: A

Watch Video Solution

24. The amount of zinc required to produce 224 ml of H_2 at STP on treatment with dilute H_2SO_4 will be (Zn = 65)

A. 65 g

B. 0.065 g

C. 0.65 g

D. 6.5 g

Answer: C

 Watch Video Solution

25. The number of significant figures for the three numbers 161 cm , 0.161 cm , 0.0161 cm are

A. 3, 3 and 4 respectively

B. 3, 4 and 4 respectively

C. 3, 4 and 5 respectively

D. 3, 3 and 3 respectively

Answer: D

Watch Video Solution

26. 100 mL of `PH_(3) on decomposition produced phosphorus and hydrogen. The change in volume is :-

A. Increase in 50 ml

B. Decrease in 50 mL

C. Increase in 150 mL

D. Decrease in 200 ml

Answer: A

Watch Video Solution

27. In the reaction, $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(l)$ When 1 mole of ammonia and 1 mole of O_2 are made to react to completion then

A. All the oxygen will be consumed

B. 1.0 mole of NO will be produced

C. 1.0 mole of H_2O is produced

D. All the ammonia will be consumed

Answer: A

Watch Video Solution

28. An organic compound containing C,H and N gave the following analysis

C=40 %,H=13.33 %,N=46.67 %

What would be its empirical formula ?

A. CH_4N

B. CH_5N

C. $C_2H_7N_2$

D. C_2H_7N

Answer: A

Watch Video Solution

29. How many gram of a dibasic acid (mol. Wt. 200) should be present in 100 mL of the aqueous solution to given 0.1 N ?

A. 10 g

B. 2 g

C. 1g

D. 20 g

Answer: C

Watch Video Solution

30. The number of atoms in 4.25 g of NH_3 is approximately

A. 4×10^{23}

B. 2×10^{23}

C. 1×10^{23}

D. 6×10^{23}

Answer: D

Watch Video Solution

31. Volume of CO_2 obtained at STP by the complete decomposition of 9.85 gm $BaCO_3$ is (Mol. wt. of $BaCO_3 = 197$)

A. 2.24 litre

B. 1.12 litre

C. 0.85 litre

D. 0.56 litre

Answer: C

Watch Video Solution

32. Percentage of Se in peroxidase anhydrase enzyme is $0.5\,\%$ by weight (at. Weight =78,4), then minimum molecular weight of peroxidase anhydrase enzyme is

A. 1.568×10^4

B. 1.568×10^3

C. 15.68

D. 2.136×10^4

Answer: A

Watch Video Solution

33. 2.5 litre of 1 M NaOH solution are mixed with another 3 litre of 0.5 M NaOH solution Then the molarity of the resultant solution is

A. 0.80 M

B. 1.0 M

C. 0.73 M

D. 0.50 M

Answer: C

Watch Video Solution

34. Which has maximum number of molecules?

A. $7gmN_2$

B. $2gmH_2$

C. $16gmNO_2$

D. $16gmO_2$

Answer: B

Watch Video Solution

35. In Haber process 30 L of dihydrogen and 30L of dinitrogen were taken for reaction which yielded only

50% of the expected product. What will be the composition of gaseous mixture under the aforesaid condition in the end ?

A. 20 litres ammonia, 20 litres nitrogen, 20 litres hydrogen

B. 10 litres ammonia, 25 litres nitrogen, 15 litres hydrogen

C. 20 litres ammonia, 10 litres nitrogen, 30 litres hydrogen

D. 20 litres ammonia, 25 litres nitrogen, 15 litres hydrogen

Answer: B

Watch Video Solution

36. The maximum number of molecules is present in

A. 15 L of water at STP

B. 15 L of H_2O gas at STP

C. 15 g of ice

D. Same in all

Answer: A

Watch Video Solution

37. Concentrated aqueous sulphuric acid is $98\,\%\,H_2SO_4$ by mass and has a density of $1.80 gmL^{-1}$. Volume of acid required to make one litre of $0.1 M H_2SO_4$ solution is

A. 1 M

B. 1.8 M

C. 18 M

D. 1.5 M

Answer: C

Watch Video Solution

38. An element, X has the following isotopic composition $^{56}X : 90\,\%\ ^{57}X : 8\,\%\ ^{57}X : 2.0\,\%$. The weighted average atomic mass of the naturallyoccurring element X is closest to

A. 56.14 amu

B. 56.8 amu

C. 60 amu

D. 55 amu

Answer: A

Watch Video Solution

39. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Volume of gaseous product after reaction

A. $1 \times 22.4L$

B. $2 \times 22.4L$

C. $3 \times 22.4L$

D. $4 \times 22.4L$

Answer: A

Watch Video Solution

40. What is the $\left[OH^{-}\right]$ in the final solution prepared by mixing $20.0mL$ of $0.050MHCl$ with $30.0mL$ of $0.10MBa(OH)_2$?

A. 0.12 M

B. 0.10 M

C. 0.40 M

D. 0.0050 M

Answer: B

Watch Video Solution

41. The number of atoms in 0.1 mole of a triatomic gas is $\left(N_A = 6.02 \times 10^{23} \text{mol}^{-1}\right)$

A. 1.800×10^{22}

B. 6.026×10^{22}

C. 1.806×10^{23}

D. 3.600×10^{23}

Answer: C

Watch Video Solution

42. The total number of electrons in 2.0 g of D_2O to that in 1.8 g of H_2O

A. Double

B. Same

C. Triple

D. One fourth

Answer: B

Watch Video Solution

43. From 200 mg of CO_2 when x molecules are removed, 2.89×10^{-3} moles of CO_2 are left. x will be

A. 10^{20} molecules

B. 10^{10} molecules

C. 21 molecules

D. 10^{21} molecules

Answer: D

Watch Video Solution

44. If the weight of metal oxide is x g containing y g of oxygen, the equivalent weight of metal will be

A. $E = \frac{8x}{y}$

B. $E = \frac{8(y-x)}{x}$

C. $E = \frac{y}{8}$

D. $E = \frac{8(x-y)}{y}$

Answer: D

Watch Video Solution

45. Give the number of significant figures

2.653×10^4

A. 8

B. 4

C. 7

D. 1

Answer: B

 Watch Video Solution

46. Mole fraction of solute in aqueous solution of 30% NaOH.

A. 0.16

B. 0.05

C. 0.25

D. 0.95

Answer: A

Watch Video Solution

Assignment Section D Assertion Reason Type Questions

1. A: $1 \mathrm{a.m.u.} = 1.66 \times 10^{-24}$ gram.

R: Actual mass of one atom of C-12 is equal to $1.99 \times 10^{-23} g$

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: B

Watch Video Solution

2. A: Unit of specific gravity is gram-cc^{-1}

R: Specific gravity is same as density of a liquid in normal conditions

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: D

Watch Video Solution

3. A: Number of atoms in 2 mole of NH_3 is equal to number of atoms in 4 mole of CH_4

R: Both are chemically similar species.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: D

Watch Video Solution

4. A: In the reaction

$2NaOH + H_3PO_4 \rightarrow Na_2HPO_4 + 2H_2O$

equivalent weight of H_3PO_4 is $\frac{M}{2}$ where M is its molecular weight.

R: Equivalent weight $= \frac{\text{molecular weight}}{\text{n-factor}}$

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: A

Watch Video Solution

5. A: Mass of 1 gram molecule of H_2SO_4 is 98 gram.

R: One gram atom contains N_A atoms.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: B

Watch Video Solution

6. A: One mole of sucrose-reacts completely with oxygen produces 268.8 litre of carbon dioxide at STP.

R: Amount of oxygen required for reaction is 268.8 litre.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: B

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7. A: In the reaction,

$2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

equivalents of NaOH, Na_2SO_4 and H_2SO_4 are equal.

R:

$\text{Number of equivalents} = \text{number of moles} \times \text{n-factor}$

.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: A

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8. A: When 4 moles of H_2 reacts with 2 moles of O_2, then 4. moles of water is formed.

R: O_2 will act as limiting reagent.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: C

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9. A: 50 ml, decinormal HCl when mixed with 50 ml, decinormal H_2SO_4, then normality of H^+ ion in resultant solution is 0.1 N.

R: Here, $MV = M_1V_1 - M_2V_2$

A. If both Assertion & Reason are true and the reason is the correct explanation of the

assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: C

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10. A : 50 ml, decimolar H_2SO_4 when mixed with 50 ml, decimolar NaOH, then normality of resultant solution is 0.05 N.

R: Here, $NV = |N_1V_1 - N_2V_2|$

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: A

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11. A : Ratio of empirical formula mass and molecular formula mass must be a natural number.

R: `"Molecular formula mass" = nX, X is "empirical formula mass", where n is the simplest whole number.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: B

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12. A: For a given solution (density $1gm/ml$), molality is greater than molarity.

R: Molarity involves volume of solution while molality involves mass of solvent.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: A

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13. A: 1 gram of salt in $1m^3$ of solution has concentration of 1 ppm.

R: ppm is defined as number of parts by mass of solute per million parts of solution.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: A

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14. A: Total charge on N_A ions of CO_3^{2-} is 1.93×10^5 coulomb.

R : Charge on one electron is 96500 coulomb.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: C

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15. A: Number of ions in 9 gram of NH_4^+ is equal to Avogadro's number (N_A).

R: Number of ions is equal to number of atoms.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion

C. If Assertion is true statement but Reason is false

D. If both Assertion and Reason are false statements

Answer: D

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