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## CHEMISTRY

## VMC MODULES ENGLISH

## SOME BASIC CONCEPT OF CHEMISTRY

Fundamental

1. If 0.5 mole of $\mathrm{BaCl}_{2}$ mixed with 0.20 mole of $\mathrm{Na}_{3} \mathrm{PO}_{4}$
the maximum number of moles of $B a_{3}\left(\mathrm{PO}_{4}\right)_{2}$ then can
be formed is
A. 0.7
B. 0.5
C. 0.3
D. 0.1

## Answer: D

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2. $8 g$ of sulphur are burnt to form $\mathrm{SO}_{2}$, which is oxidised by $C l_{2}$ water. The solution is treated with $B a C l_{2}$ solution.

The amount of $\mathrm{BaSO} O_{4}$ precipitated is:
A. 1 mole
B. 0.5 mole
C. 0.24 mole
D. 0.25 mole

## Answer: D

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3. 0.2 g if a sample of $\mathrm{H}_{2} \mathrm{O}_{2}$ required 10 ml of 1 N $\mathrm{KMnO}_{4}$ for titration in acidic medium. The percentage purity of $\mathrm{H}_{2} \mathrm{O}_{2}$ sample is:
A. 0.25
B. 0.85
C. 0.65
D. 0.95

## Answer: B

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4. A solution is prepared by adding 10 g of a substance ' $X$ ' to 36 g of water. Calculate the mass percentage of the solute.

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5. The vapour density of a volatile chloride of a metal is 95 and the specific heat of the metal is $0.13 \mathrm{cal} / \mathrm{g}$. The equivalent mass of the metal will be approximately.
A. 6 g
B. 12.3 g
C. 18 g
D. 24 g

## Answer: B

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6. Calculate the percent loss in weight after complete decomposition of a pure sample of potassium chlorate $\mathrm{KClO}_{3}(s) \rightarrow \mathrm{KCl}+\mathrm{O}_{2}(g)$
A. 0.1225
B. 0.245
C. 0.3918
D. 0.49

## Answer: C

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7. The density of a molal solution of NaOH is $1.110 \mathrm{~g} m L^{-1}$
. The molarity of the solution is
A. 2.97 M
B. 6.97 M
C. 4.97 M
D. 8.97 M

## Answer: A

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8. Element X reacts with oxygen to produce a pure sample of $X_{2} O_{3}$. In a experiment, it is found that 1.00 g of X produces 1.16 g of $X_{2} O_{3}$. What will be the atomic mass of X.
A. $67 \mathrm{~g} / \mathrm{mole}$
B. $100.2 \mathrm{~g} / \mathrm{mole}$
C. $125 \mathrm{~g} / \mathrm{mole}$
D. $150 \mathrm{~g} / \mathrm{mole}$

## Answer: D

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9. A sample of $\mathrm{H}_{2} \mathrm{SO}_{4}$ (density $1.787 \mathrm{gmL}^{-1}$ ) si labelled as $86 \%$ by weight. What is the molarity of acid? What volume of acid has to be used to make 1 L of $0.2 \mathrm{MH}_{2} \mathrm{SO}_{4}$
?
A. 16 ml
B. 10 ml
C. 12 ml
D. 18 ml
10. An aqueous solution of urea containing 18 g urea in $1500 \mathrm{~cm}^{3}$ of solution has a density of $1.5 \mathrm{~g} / \mathrm{cm}^{3}$. If the molecular weight of urea is 60 . Then the molality of solution is:
A. 0.134 m
B. 0.192 m
C. 0.064 m
D. 0.205 m

Answer: A
11. Calculate the number of molecules of oxalic acid ( $\mathrm{H}_{2} \mathrm{C}_{2} \mathrm{O}_{4}$ ) in 100 mL of 0.2 N oxalic acid
A. $10^{-3} \times 6.023 \times 10^{23}$
B. $2 \times 6.023 \times 10^{23}$
C. $3 \times 6.023 \times 10^{23}$
D. $4 \times 6.023 \times 10^{23}$

Answer: A

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12. Calcium carbonate reacts with aqueous HCl to give $\mathrm{CaCI}_{2}$ and $\mathrm{CO}_{2}$, write the reaction.
A. 0.1 g
B. 0.5 g
C. 1.5 g
D. 0.94 g

## Answer: D

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13. Chlorine is prepared in the laboratory by treating manganese dioxide ( $\mathrm{MnO}_{2}$ ) with aqueous hydrochloric
acid according to the reaction:
$4 \mathrm{HCl}(\mathrm{aq})+\mathrm{MnO}_{2}(s) \rightarrow 2 \mathrm{H}_{2} \mathrm{O}(l)+\mathrm{MnCl}_{2}(a q)+\mathrm{Cl}_{2}(g)$

How many grams of HCl react with 5.0 g of manganese dioxide?
A. 84 g
B. 0.84 g
C. 8.4 g
D. 4.2 g

## Answer: C

14. Calculate the mass of iron which will be converted into its oxide $\left(\mathrm{Fe}_{3} \mathrm{O}_{4}\right)$ by the action of 36 g steam on it .
A. 37.3 gm
B. 3.73 gm
C. 56 gm
D. 5.6 gm

## Answer: A

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15. When a sample of human blood is diluted 200 time its initial volume and microscopically examined in a layer 0.10
mm thick, an average of 30 RBC are found in $100 \times 100$ micrometer square. The number of RBC in $1 \mathrm{~mm}^{3}$ of undiluted blood is
A. $10^{6}$
B. $6 \times 10^{6}$
C. $2 \times 10^{6}$
D. $3 \times 10^{6}$

## Answer: B

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16. 1.60 g of a metal were dissolved in $\mathrm{HNO}_{3}$ to prepare its nitrate. The nitrate was strongly heated when 2.0 g of
the metal oxide was obtained. Calculate the equivalent weight of the metal.
A. 16 g
B. 32 g
C. 48 g
D. 12 g

Answer: B

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17. Equal volumes of 1 M each of $\mathrm{KMnO}_{4}$ and $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ are used to oxidise $\mathrm{Fe}(\mathrm{II})$ solution in acidic medium. The amount of Fe oxidised will be
A. More with $\mathrm{KMnO}_{4}$
B. more with $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$
C. equal with both oxidizing agents
D. cannot be determined

## Answer: B

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18. The normality of solution obtained by mixing 100 ml of
$0.2 \mathrm{M} \mathrm{H}_{2} \mathrm{SO}_{4}$ with 100 ml of 0.2 M NaOH is
A. 0.05 N
B. 0.1 N
C. 0.15 N
D. 0.2 N

## Answer: B

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19. Among the following which statement is not correct:
A. $H N O_{2}$ can act both as reducing agent and as an oxidizing agent but $\mathrm{HNO}_{3}$ acts only as an oxidizing agent.
B. The oxidation number of phosphorus can vary from
-3 to +5
C. The reaction between the NaOH and $\mathrm{H}_{2} \mathrm{SO}_{4}$ is a redox reaction.
D. Oxidation number can have positive, negative, zero or fractional values.

## Answer: C

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20. In redox reaction, $\mathrm{H}_{2} \mathrm{O}_{2}$ oxidises $\mathrm{K}_{4}\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]$ into
$\mathrm{K}^{+}, \mathrm{Fe}^{+3}, \mathrm{CO}_{3}^{-2}$ and $\mathrm{NO}_{3}^{-}$ions in acidic medium, than
how many moles of $\mathrm{H}_{2} \mathrm{O}_{2}$ will react with 1 mole of $K_{4}\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]$
A. 5 mole
B. 9 mole
C. 8 mole
D. 30.5 mole

## Answer: D

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21. A 20.00 ml sample of $B a(O H)_{2}$ solution is titrated with 0.245 M HCl . If 27.15 ml of HCl is required, then the molarity of the $\mathrm{Ba}(\mathrm{OH})_{2}$, solution will be :
A. 0.166 M
B. 0.180 M
C. 0.333 M
D. 0.666 M

## Answer: A

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22. Benzene diazonium chloride, $C_{6} H_{5} \stackrel{+}{N_{2}} \bar{C} I$, was decomposed in the presence of hypo phosphorous acid and the nitrogen evolved after drying was found to be 36.9 ml at one atmosphere and $27^{\circ} \mathrm{C}$. The amount of salt taken must be nearly:
A. 481 mg
B. 240 mg
C. 210 mg
D. 140 mg

## Answer: C

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23. A sample of hard water is found to contain 40 mg of $C a^{2+}$ ions per litre. The amount of washing shoda ( $\mathrm{Na}_{2} \mathrm{CO}_{3}$ ) required to soften $5 \cdot 0 \mathrm{~L}$ of the sample would be
A. 1.06 g
B. 5.3 g
C. 53 mg
D. 530 mg

## Answer: D

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24. The hydrated salt $\mathrm{Na}_{2} \mathrm{SO}_{4} \cdot n \mathrm{H}_{2} \mathrm{O}$ undergoes $56 \%$ loss in mass on heating and becomes anhydrous. The value of ' $n$ ' will be :
A. 5
B. 3
C. 7
D. 10

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25. 1.520 g of the hydroxide of a metal on ignition gave $0.995 g$ of oxide. The equivalent weight of metal is
A. 1.52 g
B. 0.995 g
C. 19 g
D. 9 g

Answer: D
26. 100 ml of $0.01 \mathrm{M} \mathrm{H}_{2} \mathrm{SO}_{4}$ is titrated against 0.2 M
$\mathrm{Ca}(\mathrm{OH})_{2}$, volume of $\mathrm{Ca}(\mathrm{OH})_{2}$ required to reach end point will be :
A. 5 ml
B. 10 ml
C. 20 ml
D. 15 ml

Answer: A

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27. The molar ratio of $F e^{++}$to $F e^{+++}$in a mixture of $\mathrm{FeSO}_{4}$ and $\mathrm{Fe}_{2}\left(\mathrm{SO}_{4}\right)_{3}$ having equal number of sulphate ion in both ferrous and ferric sulphate is
A. 1: 2
B. $3: 2$
C. $2: 3$
D. can't be determined

## Answer: B

28. The number of oxygen atoms required to combine with 7 g of $N_{2}$ to form $N_{2} O_{3}$ when $80 \%$ of $N_{2}$ is converted to $\mathrm{N}_{2} \mathrm{O}_{3}$.
A. $2.3 \times 10^{23}$
B. $3.6 \times 10^{23}$
C. $1.8 \times 10^{21}$
D. $5.4 \times 10^{21}$

Answer: B

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29. Change in volume when $100 \mathrm{~mL} \mathrm{PH}_{3}$ decomposed to solid phosphorus and $\mathrm{H}_{2}$ gas.
A. 50 ml increase
B. 500 ml decrease
C. 900 ml increase
D. No change in volume

## Answer: A

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30. Hydrolic acid solution $A$ and $B$ have concentration of 0.5 N and 0.1 N respectively. The volume of solutions A and
$B$ required to make 2 litres of 0.2 N hydrochloric are
A. $0.5 \operatorname{lof} A+1.5 l o f B$
B. $1.5 \operatorname{lof} A+0.5 l o f B$
C. 1.0lof $A+1.0$ lof $B$
D. $0.75 l \mathrm{of} A+1.25 l \mathrm{of} B$

## Answer: A

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31. A mole of $N_{2} H_{4}$ loses 10 mol of electrons to form a new compound Y . Assuming that all the nitrogen appears in the new compound, what is the oxidation state of
nitrogen in $Y$ ? ( There is no change in the oxidation number of hydrogen.)
A. -1
B. -3
C. +3
D. +5

## Answer: C

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32. An ore contains $1.34 \%$ of the mineral argentite, $A g_{2} S$,
by mass. How many gram of this ore would have to be
processed in order to obtain 1.00 g of pure solid silver, Ag ?
A. 74.6 g
B. 85.7 g
C. 107.9 g
D. 134 g

Answer: B

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33. $A$ mixture of $C_{3} H_{8}(g) \& O_{2}$ having total volume 100 ml in an Eudiometry tube is sparked \& it is observed that a
contraction of 45 ml us observed what can be the composition of reacting mixture.
A. $35 \mathrm{mlC}_{3} \mathrm{H}_{8}$ and $65 \mathrm{mlO}_{2}$
B. $25 \mathrm{mlC}_{3} \mathrm{H}_{8}$ and $75 \mathrm{mlO}_{2}$
C. $45 \mathrm{mlC}_{3} \mathrm{H}_{8}$ and $55 \mathrm{mlO}_{2}$
D. $55 \mathrm{mlC}_{3} \mathrm{H}_{8}$ and $45 \mathrm{mlO}_{2}$

## Answer: B

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34. In the following reaction,
$\mathrm{As}_{2} \mathrm{SO}_{3}+\mathrm{H}^{+}+\mathrm{NO}_{3}^{-} \rightarrow \mathrm{NO}+\mathrm{H}_{2} \mathrm{O}+\mathrm{AsO}_{3}^{3-}+\mathrm{SO}_{4}^{2-}$
the equivalent mass of $\mathrm{As}_{2} \mathrm{SO}_{3}$ is related to its molecular mass by:
A. $M / 2$
B. $M / 4$
C. $M / 28$
D. $M / 24$

Answer: C

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35. Calculate the no. of molecules in 12 g of carbon.
36. x' g of $\mathrm{KCIO}_{3}$ on decomposition gives 'y' ml of $\mathrm{O}_{2}$ at STP. The percentage purity of $\mathrm{KCIO}_{3}$ would be :
A. $\frac{y \times 2 \times M}{22.4 \times 3 \times x} \times 100$
B. $\frac{y \times 3 \times M}{224 \times 2 \times x} \times 100$
C. $\frac{y \times 2 \times M}{22400 \times 3 \times x} \times 100$
D. $\frac{y \times 3 \times M}{22400 \times 2 \times x} \times 100$

## Answer: A

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37. Calculate the no. of molecules in 64 g of oxygen.
38. 10.78 g of $\mathrm{H}_{3} \mathrm{PO}_{4}$ in 550 ml solution is 0.40 N . Thus
this acid:
A. has been neutralized to $H P O_{4}^{2-}$
B. has been neutralized to $P O_{4}^{3-}$
C. has been reduced to $\mathrm{HPO}_{3}^{2-}$
D. has been neutralized to $\mathrm{H}_{2} \mathrm{PO}_{4}^{-}$

## Answer: A

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39. The labeling on a bottle of $\mathrm{H}_{2} \mathrm{O}_{2}$ solution is 20 vol , then the concentration of $\mathrm{H}_{2} \mathrm{O}_{2}$ in percentage strength will be:
A. 0.0303
B. 0.05
C. 0.0455
D. 0.0607

## Answer: D

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40. 33.6 g of an impure sample of sodium bicarbonate was heated strongly and it gave $4.4 \mathrm{~g} \mathrm{CO}_{2}$. The percentage purity of NaHCO 3 will be:
A. 0.25
B. 0.5
C. 0.75
D. 1

## Answer: B

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41.1 mol of $\mathrm{N}_{2}$ and 4 mol of $\mathrm{H}_{2}$ are allowed to react in a vessel and after reaction, $\mathrm{H}_{2} \mathrm{O}$ is added. Aqueous solution required 1 mol of HCl for neutralization. Mol
fraction of $\mathrm{H}_{2}$ in the mixture after reaction is :
A. $\frac{1}{2}$
B. $\frac{5}{6}$
C. $\frac{1}{3}$
D. $\frac{3}{4}$


## Answer: B

42. A sample of tap water contains 366 ppm of $\mathrm{HCO}_{3}^{-}$ ions with $C a^{2+}$ ion. Now $\mathrm{Ca}^{2+}$ removed by Clark's method by addition of $\mathrm{Ca}(\mathrm{OH})_{2}$. Then what minimum mass of $\mathrm{Ca}(\mathrm{OH})_{2}$ will be required to remove $\mathrm{HCO}_{3}^{-}$ ions completely from 500 g of same tap water
A. 1 g
B. 0.4 g
C. 0.222 g
D. 0.111 g

## Answer: C

43. $\mathrm{Fe}_{0.94} \mathrm{O} \rightarrow \mathrm{Fe}^{3+}$, the equivalent mass of $\mathrm{Fe}_{0.94} \mathrm{O}$ will be:
A. $\frac{\text { mol. Mass }}{2}$
B. $\frac{\text { mol.mass }}{3}$
C. $\frac{3 \times \text { mol. Mass }}{8}$
D. $\frac{\text { mol.mass }}{0.87}$

## Answer: D

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44. The reaction between yttrium metal and dilute HCl produces $H_{2}(g)$ and $Y^{3+}$ ions. The molar ratio of yttrium
to that hydrogen produced is
A. $1: 2$
B. 2:1
C. $2: 3$
D. $3: 2$

## Answer: C

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45. The density of liquid ethanol is $0.7892 \mathrm{~g} / \mathrm{ml}$ at $20^{\circ} \mathrm{C}$. If
1.2 mol of ethanol are needed for a particular experimental, what volume of ethanol should be measured out?
A. 55 ml
B. 58 ml
C. 70 ml
D. 79 ml

## Answer: C

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46. A 10 g sample of a mixture of calcium chloride and sodium chloride is treated with $\mathrm{Na}_{2} \mathrm{CO}_{3}$ to precipitate calcium as calcium carbonate. This $\mathrm{CaCO}_{3}$ is heated to convert all the calcium to CaO and the final mass of CaO
is 1.12 gm . Calculate $\%$ by mass of NaCl in the original mixture.
A. 0.152
B. 0.321
C. 0.218
D. 0.1107

## Answer: B

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47. $1 g$ of the carbonate of a metal was dissolved in $25 m L$ of $N-H C l$. The resulting liquid required $5 m L$ of
$N-N a O H$ for neutralisation. The $E w$ of the metal
Carbonate is
A. 50
B. 30
C. 20
D. 40

Answer: A

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Enable

1. From 200 mg of $\mathrm{CO}_{2}, 10^{21}$ molecules are removed. How many grams and moles of $\mathrm{CO}_{2}$ are left.
A. $2.88 \times 10^{-3}$
B. $1.44 \times 10^{-3}$
C. $3.68 \times 10^{-3}$
D. $5.42 \times 10^{-3}$

## Answer: A

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2. The nitrate ion can be converted into ammonium ion.

The equivalent mass of $\mathrm{NO}_{3}^{-}$ion in this reaction would
be :
A. 6.20 g
B. 7.75 g
C. 10.5 g
D. 21.0 g

Answer: B

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3. A 2 g sample of xenon reacts with fluorine. The mass of the compound produced is 3.158 g . The empirical formula of the compound is: (Given : Atomic mass of $\mathrm{Xe}=131$ g/mole)
A. $X e F_{2}$
B. $\mathrm{XeF}_{4}$
C. $\mathrm{XeF}_{5}$
D. $\mathrm{XeF}_{6}$

## Answer: B

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4. A hydrate of iron (III) thiocynate $F e(S C N)_{3}$, was found
to contain $19 \% \mathrm{H}_{2} \mathrm{O}$. What is the formula of the hydrate?
A. $\mathrm{Fe}(\mathrm{SCN})_{3} . \mathrm{H}_{2} \mathrm{O}$
B. $\mathrm{Fe}(\mathrm{SCN})_{3} \cdot 2 \mathrm{H}_{2} \mathrm{O}$
C. $\mathrm{Fe}(\mathrm{SCN})_{3} .3 \mathrm{H}_{2} \mathrm{O}$
D. $\mathrm{Fe}(\mathrm{SCN})_{3} .4 \mathrm{H}_{2} \mathrm{O}$

## Answer: C

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5. Mole fraction of solvent in 0.2 m binary aqueous solution of camphor ( $m=$ molality) is :
A. 0.996
B. 0.004
C. 0.96
D. 0.976

Answer: B

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6. $D N A$ has density $1.1 g / m L$. And its molecular weight is $6 \times 10^{3} \mathrm{~g} / \mathrm{mol}$. Average volume occupied by its single molecule will be :
A. $9.1 \times 10^{-20}$
B. $9.1 \times 10^{-21}$
C. $9.8 \times 10^{-24}$
D. $9.6 \times 10^{-28}$

Answer: B

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7. 1.0 gm of a mixture of $\mathrm{CaCO}_{3}$ and NaCl reacts completely with 120 ml of $\mathrm{N} / 10 \mathrm{HCl}$. The percentage of NaCl in the mixture is:
A. 40
B. 0.5
C. 0.6
D. 0.66

Answer: A
8. A liter of sea water (which weighs 1030 g ) contains about $6 \times 10^{-3} g$ of dissolved oxygen $\left(O_{2}\right)$, such a small concentration can be exoressed as $\qquad$ ppm of sea waer
A. 4.2 ppm
B. 5.8 ppm
C. 6.4 ppm
D. 7.5 ppm

## Answer: B

9. $0.62 \mathrm{~g} \mathrm{Na} \mathrm{N}_{2} \mathrm{CO}_{3} . x \mathrm{H}_{2} \mathrm{O}$ completely neutralises 100 ml of $\mathrm{N} / 10 \mathrm{H}_{2} \mathrm{SO}_{4}$. The value of x must be:
A. 1
B. 6
C. 8
D. 10

Answer: A

## D Watch Video Solution

10. What is the quantity of water that should be added to

16 gm . Methanol to make the mol fraction of methanol as
0.25 ?
A. 27 gm
B. 12 gm
C. 18 gm
D. 36 gm

## Answer: A

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11. When excess of $\mathrm{CaCO}_{3}$ is treated with 100 ml . of HCl solution, the $\mathrm{CO}_{2}$ gas obtained was found to be 1.12 litre (at N.T.P.). What is the normality of HCl ?
A. 0.2 N

B. 1 N

C. 0.1 N
D. 2 N

## Answer: B

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12. What weight of a metal of equivalent weight 12 will give $0.475 g$ of its chloide?
A. 0.20 gm
B. 0.16 gm
C. 0.12 gm
D. 0.18 gm

Answer: B

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13. A sample of $\mathrm{H}_{2} \mathrm{O}_{2}$ is $\mathrm{x} \%$ by mass x ml of $\mathrm{KMnO}_{4}$ are required to oxidize one gram of this $\mathrm{H}_{2} \mathrm{O}_{2}$ sample.

Calculate the normality of $\mathrm{KMnO}_{4}$ solution.
A. 0.25 N
B. 0.49 N
C. 0.59 N
D. 1.20 N

Answer: C

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14. A gas jar contains 1.7 g of ammonia gas. Calculate the following: a) Molar mass of ammonia.

## D Watch Video Solution

15. 30 mL of $0.2 N B a C l_{2}$ is mixed with 40 mL of $0.3 \mathrm{NAl}_{2}\left(\mathrm{SO}_{4}\right)_{3}$. How many g of $\mathrm{BaSO}_{4}$ are formed?
A. 0.233 g
B. 0.466 g
C. 1.233 g
D. 2.466 g

## Answer: A

## D Watch Video Solution

16. Mole fraction of ethanol in ethanol water mixture is
0.25 . Hence, the percentage concentration of ethanol by weight of mixture is
A. 0.54
B. 0.25
C. 0.75
D. 0.46

## Answer: D

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17. What is the percentage loss in water when $\mathrm{BaCI} I_{2} \cdot 2 \mathrm{H}_{2} \mathrm{O}$ becomes completely anhydrous?
A. 0.1475
B. 0.2822
C. 0.8525
D. 0.4327

## - Watch Video Solution

18. A gas jar contains 1.7 g of ammonia gas. Calculate the following: a) Number of moles of ammonia present in the gas jar.

## - Watch Video Solution

19. A 0.5 g sample containing $\mathrm{MnO}_{2}$ is treated with HCl
liberating $C l_{2}$ is passed into a solution of KI and 30.0 mL of " $0.1 \mathrm{M} \mathrm{Na} \mathrm{N}_{2} \mathrm{~S}_{2} \mathrm{O}_{3}$ are required to titrate the liberated iodine. Calculate the percentage of $\mathrm{MnO}_{2}$ is the sample.
A. 0.0138
B. 0.0261
C. 0.261
D. 0.601

## Answer: C

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20. $P$ and $Q$ are two element that form $P_{2} Q_{3}$ and $P Q_{2}$. If
0.15 mole of $P_{2} Q_{3}$ weighs 15.9 g and 0.15 mole of $P Q_{2}$ weighs $9.3 g$, what are the atomic weights of $P$ and $Q$ ?
A. 18,26
B. 26,18
C. 15,24
D. 24,15

## Answer: B

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21. Which of the following should be done in order to prepare 0.40 M NaCl starting with 100 ml of 0.30 M NaCl
(Mol. Mass of $\mathrm{NaCl}=58.5$ )?
A. Add 0.585 g NaCl
B. Add 20 ml water
C. Add 0.010 ml NaCl

## D. Evaporate 10 ml water

## Answer: A

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22. A 500 g toothpaste sample has 0.2 g fluoride concentration. What is the concentration of $F^{\Theta}$ in ppm ?
A. 250
B. 200
C. 400
D. 1000
23. The mass of $70 \% \mathrm{H}_{2} \mathrm{SO}_{4}$ required for neutralization of one mole of NaOH is:
A. 49 gm
B. 98 gm
C. 70 gm
D. 34.3 gm

## Answer: C

24. Hydrogen peroxide in aqueous solution decomposes on warming to give oxygen according to the equation
$2 \mathrm{H}_{2} \mathrm{O}_{2}(a q) \rightarrow 2 \mathrm{H}_{2} \mathrm{O}(l)+\mathrm{O}_{2}(g)$
under conditions where 1 mole of gas occupies 24 dm .
$100 \mathrm{~cm}^{3}$ of XM solution of $\mathrm{H}_{2} \mathrm{O}_{2}$ produces $3 \mathrm{dm}^{3}$ of $\mathrm{O}_{2}$.

Thus, X is :
A. 2.5
B. 1
C. 0.5
D. 0.25

## Answer: A

25. For $1.34 \times 10^{-3}$ moles of KBrO 3 to reduce into bromide $4.02 \times 10^{-3}$ mole of $X^{n+}$ ion is needed. New oxidation state of X is:
A. $n+2$
B. $n-2$
C. 2
D. -2

Answer: A

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26. Find the percentage of calcium in calcium oxide.

## D Watch Video Solution

27. 6 mole of $\mathrm{FeC}_{2} \mathrm{O}_{4}$ on treatment with 2 mole of
$\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ in acidic medium evolves x litre of $\mathrm{CO}_{2}$ gas at STP. The value of $x$ would be:
A. $22.4 l$
B. $44.8 l$
C. $67.2 l$
D. $179.2 l$

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28. Volume $V_{1} \mathrm{~mL}$ of $0.1 \mathrm{M} \mathrm{K} \mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ is needed for complete oxidation of $0.678 \mathrm{~g} N_{2} H_{4}$ in acidic medium.The volume of $0.3 \mathrm{M} \mathrm{KMnO}_{4}$ needed for same oxidation in acidic medium will be :
A. $\frac{2}{5} V_{1}$
B. $\frac{5}{2} V_{1}$
C. $113 V_{1}$
D. $\frac{7}{5} V_{1}$

## Answer: A

29. How many ml of $0.3 \mathrm{M} \mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ (acidic) is required for complete oxidation of 5 ml of $0.2 \mathrm{M} \mathrm{SnC} \mathrm{C}_{2} \mathrm{O}_{4}$ solution.
A. 3.33 ml
B. 1.11 ml
C. 11 ml
D. 4.44 ml

## Answer: B

30. A mixture of petrol and ethyl alcohol contains 22.0 \% alcohol. The density of the mixture is $0.800 \mathrm{gmL}^{-1}$. What mass of alcohol is there in 40.0 mL of the mixture?
A. 7.04 gm
B. 4.40 gm
C. 11 gm
D. 15 gm

Answer: A

- Watch Video Solution

31. Which of the following should be done in order to prepare 0.40 M NaCl starting with 100 ml of 0.30 M NaCl (Mol. Mass of $\mathrm{NaCl}=58.5$ )?
A. add 0.745 g KCl
B. add 20 ml water
C. add 0.1 mole KCl
D. Evaporate 10 ml water

## Answer: A

32.35 ml sample of hydrogen peroxide gives off 500 ml of
$O_{2}$ at $27^{\circ} \mathrm{C}$ and 1 atm pressure. Volume strength of $\mathrm{H}_{2} \mathrm{O}_{2}$ sample will be:
A. 10 volume
B. 13 volume
C. 11 volume
D. 12 volume

Answer: B
33. When 2.76 g of silver carbonate is strongly heated, it yields a residue weighing
A. 2.16 g
B. 2.48 g
C. 2.32 g
D. 2.64 g

## Answer: A

## - Watch Video Solution

34. A spherical ball of radius 3 cm contains $66.66 \%$ iron. If density of ball is $1.5 \mathrm{~g} / \mathrm{cm}^{3}$ then the number of mole of Fe
present approximately is:
A. 1
B. 2
C. 20
D. 10

## Answer: B

## - Watch Video Solution

35. Specific volume of cylindrical virus particle is $6.02 \times 10^{-2} c c / g$, whose radius and length are $7 \AA$ and $10 \AA$ respectively. If $N_{A}=6.023 \times 10^{23}$, find molecular weight of virus.
A. $15.4 \mathrm{Kg} / \mathrm{mol}$
B. $1.54 \times 10^{4} \mathrm{Kg} / \mathrm{mol}$
C. $3.08 \times 10^{4} \mathrm{Kg} / \mathrm{mol}$
D. $3.08 \times 10^{3} \mathrm{Kg} / \mathrm{mol}$

## Answer: A

## - Watch Video Solution

36. One litre of a sample of hard water contain
$4.44 \mathrm{mgCaCl}{ }_{2}$ and $1.9 \mathrm{mgof} \mathrm{MgCl}_{2}$. What is the total hardness in terms of ppm of $\mathrm{CaCO}_{3}$ ?
A. 2 ppm
B. 3 ppm
C. 4 ppm
D. 5.12 ppm

## Answer: C

## D Watch Video Solution

37. A 2.0 g sample containing $\mathrm{Na}_{2} \mathrm{CO}_{3}$ and $\mathrm{NaHCO}_{3}$ loses 0.248 g when heated at $300^{\circ} \mathrm{C}$, the temperature at which NaHCO decomposes to $\mathrm{Na}_{2} \mathrm{CO}_{3}, \mathrm{CO}_{2}$ and $\mathrm{H}_{2} \mathrm{O}$. What is the percentage of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ in the mixture ?
A. 0.3333
B. 0.6666
C. 0.25
D. 0.5

## Answer: B

## D Watch Video Solution

38.500 ml of a solution contain 12.6 grams of oxalic acid [Mol. Mass $=126 \mathrm{~g} / \mathrm{mole}$ ]. 10 ml of this solution is diluted to 100 ml in a flask. What is the molarity of the resultant solution?
A. 0.1
B. 0.2
C. 0.01
D. 0.02

## Answer: D

## D Watch Video Solution

39. Equal volumes of 0.2 M HCI and 0.4 M KOH are mixed.

The concentration of ions in the resulting solution are:
A. $\left[K^{+}=0.4 M,\left[C 1^{-}\right]=0.2 M,\left[H^{+}\right]=0.2 M\right.$
B. $\left[\mathrm{K}^{+}\right]=0.2 \mathrm{M},\left[\mathrm{C1}^{-}\right]=0.1 \mathrm{M},\left[\mathrm{OH}^{-}\right]=0.1 \mathrm{M}$
C. $\left[K^{+}\right]=0.1 M,\left[\mathrm{C1}^{-}\right]=0.1 M,\left[\mathrm{OH}^{-}\right]=0.1 M$
D. $\left[\mathrm{K}^{+}\right]=0.2 \mathrm{M},\left[\mathrm{C1}^{-}\right]=0.1 \mathrm{M},\left[\mathrm{OH}^{-}\right]=0.2 \mathrm{M}$
40. $1 g$ of the carbonate of a metal was dissolved in $25 m L$ of $N-\mathrm{HCl}$. The resulting liquid required $5 m L$ of
$N-N a O H$ for neutralisation. The $E w$ of the metal
Carbonate is
A. 100
B. 30
C. 40
D. 50

Answer: D
41. A sample of chalk $\left(\mathrm{CaCO}_{3}\right)$ is contaminated with calcium sulphate 1.0 g of the solid is dissolved in 230 mL of " $\frac{N}{10} \mathrm{HCl}, 40.1 \frac{N}{10} \mathrm{NaOH}$ is requried to neutralise the excess acid. What ist he percentage of chalk in the mixture.
A. 0.05
B. 0.35
C. 0.65
D. 0.95

Answer: D
42. 2 grams of a gas mixture of CO and $\mathrm{CO}_{2}$ on reaction with excess $I_{2} O_{5}$ yields 2.54 grams of $I_{2}$. What would be the mass \% of CO in the original mixture?
A. $70 \%$
B. $95.3 \%$
C. $88.4 \%$
D. $80.7 \%$

Answer: A
43. The number of moles of $\mathrm{KMnO}_{4}$ that will be needed to react with one mole of sulphite ion in acidic solution is:
A. $2 / 5$
B. $3 / 5$
C. $4 / 5$
D. 1

Answer: A

- Watch Video Solution

44. In an organic compound of molar mass greater than 100 containing only $C, H$ and $N$, the percentage of $C$ is 6 times the percentage of $H$ while the sum of the percentage of $C$ and H is 1.5 times the percentage of $N$.

What is the least molar mass :
A. $175 \mathrm{~g} / \mathrm{mole}$
B. $140 \mathrm{~g} / \mathrm{mole}$
C. $105 \mathrm{~g} / \mathrm{mole}$
D. $210 \mathrm{~g} / \mathrm{mole}$

## Answer: B

45. 0.7 grams of $\mathrm{Na}_{2} \mathrm{CO}_{3} . x \mathrm{H}_{2} \mathrm{O}$ were dissolved in water and the volume was made to $100 \mathrm{~mL}, 20 \mathrm{~mL}$ of this solution required 19.8 mL of $\mathrm{N} / 10 \mathrm{HCl}$ for complete neutralization. The value of $x$ is Report your answer by rounding it upto nearest whole number.
A. 7
B. 3
C. 2
D. 5

## Answer: C

## - Watch Video Solution

46. Exactly 4.00 gm of a solution of $\mathrm{H}_{2} \mathrm{SO}_{4}$ was diluted with water and excess $B a C l 2$ was added. The washed and dried precipitated of $\mathrm{BaSO}_{4}$ weighed 4.08 gm . The percent $\mathrm{H}_{2} \mathrm{SO}_{4}$ in the original acid solution is:
A. $43.0 \%$
B. $4.3 \%$
C. $47 \%$
D. $56 \%$

## Answer: A

47. A sample of ammonium phosphate $\left(\mathrm{NH}_{4}\right)_{3} \mathrm{PO}_{4}$ contains 3.18 moles of hydrogen atoms. The number of moles of oxygen atoms in the sample is
A. 0.265 moles
B. 0.795 moles
C. 1.06 moles
D. 3.18 moles

## Answer: C

48. What volume of $96 \% \mathrm{H}_{2} \mathrm{SO}_{4}$ solution (density 1.83
$\mathrm{g} / \mathrm{mL}$ ) is required to prepare 4 litre of $3.0 \mathrm{M} \mathrm{H}_{2} \mathrm{SO}_{4}$ solution?
A. 335 ml
B. 670 ml
C. 167.5 ml
D. 572 ml

Answer: A

- Watch Video Solution

49. Hardness of water sample is $300 \mathrm{ppm} \mathrm{CaCO}_{3}$ Hence its molarity is:
A. 0.3 M
B. 0.030 M
C. 0.003 M
D. 0.0015 M

## Answer: C

D Watch Video Solution

Efficient

1. 250 " mL of " $x M$ solution and 500 " mL of " $\mathrm{y} M$ solution of a solute are mixed and diluted to 2 L to produce a final concentration of 1.6 M . If $x: y=5: 4$, calculate x and y .
A. $3.94,4.92$
B. 4.92, 4.92
C. $4.92,3.94$
D. $3.94,3.94$

## Answer: C

2. $2.68 \times 10^{-3}$ moles of a solution containing an ion $A^{n+}$ require $1.61 \times 10^{-1}$ moles of $\mathrm{MnO}_{4}^{-}$ion for the oxidation of $A^{n+}$ to $A O_{3}^{-}$in acidic medium. What is the value of $n$ ?
A. 2
B. 3
C. 5
D. 4

## Answer: A

3. 30 ml of $\mathrm{N} / 10 \mathrm{HC} 1$ is required to neutralize 50 ml of a sodium carbonate solution. What volume of water (in ml ) must be added to 30 ml of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ solution so that the final solution has concentration $\mathrm{N} / 50$ ?
A. 20 ml
B. 30 ml
C. 50 ml
D. 60 ml

## Answer: D

4. Molecular mass of KOH is

## D Watch Video Solution

5. Two acids $A$ and $B$ are titrated separately each time with 25 " mL of " $N-N a_{2} C O_{3}$ solution to requrie 10 mL and 40 mL respectively, of their solution for complete neutralisation. What volume of $A$ and $B$ would you mix to produce 1 L of N -acid solution?
A. $A=100 \mathrm{ml}, B=200 \mathrm{ml}$
B. $A=300 \mathrm{ml}, B=200 \mathrm{ml}$
C. $A=200 \mathrm{ml}, B=800 \mathrm{ml}$
D. $A=400 \mathrm{ml}, B=400 \mathrm{ml}$

Answer: C

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6. In an ore the oxidisable is $\mathrm{Sn}^{2+}$. This is ore is titrated with a dichromate solution containing $2.5 \mathrm{~g} \mathrm{~K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ in 0.50 litre. A 0.40 g of sample of the ore required $10.0 \mathrm{~cm}^{3}$ of the titrant to reach equivalent point. If the percentage of tin in ore is $x$, then what is the value of $x / 5$ ? ( $\mathrm{K}=39.1, \mathrm{Cr}=52, \mathrm{Sn}=118.7$ )
A. 0.15
B. 0.25
C. 0.3
D. 0.67

## Answer: A

## - Watch Video Solution

7. A sample of gaseous hydrocarbon occupying 1.12litre at $N T P$, when completely burnt in air produced $2.2 g \mathrm{CO}_{2}$ and $1.8 g \mathrm{H}_{2} \mathrm{O}$. Calculate the weight of hydrocarbon taken and the volume of $O_{2}$ at $N T P$ required for its combustion.
A. $\mathrm{CH}_{4}$
B. $C_{2} H_{6}$
C. $\mathrm{C}_{3} \mathrm{H}_{8}$
D. $C_{4} H_{10}$

## Answer: A

## - Watch Video Solution

8. A sample of hard water contains 20 mg of $C a^{2+}$ ions per litre. How many millimoles of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ would be requried to soften 1 L of the sample. Also calculate the mass of $\mathrm{Na}_{2} \mathrm{CO}_{3}$.
A. 1
B. $10^{-3}$
C. 10
D. $10^{-5}$

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9. A drug marijuana owes its activity to tetrahydrocannabinol, which contains $70 \%$ as many carbon atoms as hydrogen atoms and 15 times as many hydrogen atoms as oxygen atoms. If the number of moles in 1 gm of tetrahydrocannabinol are $0.00318^{\prime}$ moles then its molecular formula will be:
A. $\mathrm{C}_{21} \mathrm{H}_{30} \mathrm{O}_{2}$
B. $\mathrm{C}_{21} \mathrm{H}_{15} \mathrm{O}$
C. $C_{31} H_{15} O$
D. $\mathrm{C}_{31} \mathrm{H}_{15} \mathrm{O}_{2}$

Answer: A

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10. How much $\mathrm{NaNO}_{3}$ must be weighed out to make 50 ml of an aqueous solution containing $70 \mathrm{mg} \mathrm{Na}{ }^{+}$per ml ?
A. 14 gm
B. 13 gm
C. 18 gm
D. 27 gm

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11. A silver coin weighing 2.5 gm was dissolved in $\mathrm{HNO}_{3}$ and then further treated with excess HCl . The mass of $A g C I$ formed was 2.99 gm . The percentage of silver in the coin will be:
A. 0.75
B. 0.9
C. 0.35
D. 0.1

## - Watch Video Solution

12. Molecular mass of carbon dioxide is

## - Watch Video Solution

13. Molecular mass of methane is

## - Watch Video Solution

14. 5 gm of $\mathrm{K}_{2} \mathrm{SO}_{4}$ solution were dissolved in 250 ml of
water. How many ml of this solution are needed to precipitate out 1.2 gm of $\mathrm{BaSO}_{4}$ on addition of $\mathrm{BaCI}_{2}$ ?
A. 44.8 ml
B. 22.4 ml
C. 11.8 ml
D. 22400 ml

## Answer: A

## - Watch Video Solution

15. Molecular mass of NaOH is
16. Gastric juice contains about 3.0 g HCl per litre. If a person produces about 2.5 L of gastric juice per day, how many antacid tablets each containing 400 mg of
$\mathrm{Al}(\mathrm{OH})_{3}$ are needed to neutralise all the HCl produced in one day.
A. 13
B. 14
C. 15
D. 16

## Answer: B

17. Molecular mass of $\mathrm{H}_{2} \mathrm{O}_{2}$ is

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18. Calculate the number of moles in 22 g of helium.

## - Watch Video Solution

19. The formula weight of an acid is $82 a \mu$. Intitration $100 \mathrm{~cm}^{3}$ of a solution of this acid containing $39.0 g$ of the acid per litre were completely neutralised by $95.0 \mathrm{~cm}^{3}$ of aqueous NaOH containing 40.0 g of NaOH per litre. What is the basicity of the acid?
A. 2
B. 1
C. 4
D. 3

## Answer: A

## - Watch Video Solution

20. Calculate the number of moles in 69 g of sodium.

## - Watch Video Solution

21. You are given one litre of 0.183 M HCI and one litre of
which you can make from these two solution? (Assume that no water is added).
A. 1921 ml
B. 1435 ml
C. 928 ml
D. 2017 ml

## Answer: B

## - Watch Video Solution

22. How many milliliter of conc. HCl of specific gravity 1.19
and which contains $37 \%$ by mass HCl will be required to prepare 2 litre of decinormal solution?
A. 13.22 ml
B. 23.41 ml
C. 16.58 ml
D. 28.26 ml

## Answer: C

## - Watch Video Solution

23. Cuprous sulphide and silver sulphide are isomorphous. The atomic mass of Cu is $63.57 \mathrm{~g} / \mathrm{mole}$. If the percentage composition of Sulphur in each of these is
$20.14 \%$ and $12.94 \%$ respectively then the atomic mass of silver will be:
A. $126.4 \mathrm{~g} / \mathrm{mole}$
B. $107.74 \mathrm{~g} / \mathrm{mole}$
C. $47 \mathrm{~g} / \mathrm{mole}$
D. $210.23 \mathrm{~g} / \mathrm{mole}$

## Answer: B

## - Watch Video Solution

24. A blackened silver coin weighing 15 g on treatment with HCl yielded 25 ml of $H_{2} S$ at $12^{\circ} \mathrm{C}$ and 775 mmHg . What percentage of the original silver tranished?
A. 0.1088
B. 0.0734
C. 0.0365
D. 0.0153

## Answer: D

## - Watch Video Solution

25. A small amount of CaCO completely neutralises 525 mL of 0.1 N HCl and no acid is left in the end. After converting all calcium chlorine to $\mathrm{CaSO}_{4}$, how much plaster of Paris can be obtained?
A. 3.8 gm
B. 14.2 gm
C. 5.6 gm
D. 17.43 gm

## Answer: A

## - Watch Video Solution

26. 12 ml of a mixture of alkane and alkene having same number of carbon atoms requires exactly 57 ml of oxygen for complete combustion. The name of hydrocarbons if
$\mathrm{CO}_{2}$ formed is 36 ml are
A. $\mathrm{CH}_{4}$ and $\mathrm{C}_{3} \mathrm{H}_{6}$
B. $C_{2} H_{6}$ and $C_{2} H_{4}$
C. $C_{3} H_{6}$ and $C_{3} H_{8}$
D. $C_{3} H_{6}$ and $C_{3} H_{4}$

## Answer: C

## - Watch Video Solution

27. Oxalic acid reacts with NaOH according to the given reaction. $(\mathrm{COOH})_{2}+2 \mathrm{NaOH} \rightarrow(\mathrm{COONa})_{2}+2 \mathrm{H}_{2} \mathrm{O}$ If 0.816 g of oxalic acid dihydrate. $(\mathrm{COOH})_{2} 2 \mathrm{H}_{2} \mathrm{O}$, is dissolved in 1 L of water and titrated with 0.120 M NaOH solution, what volume of NaOH will be needed?
A. 108 ml
B. 187 ml
C. 127 ml
D. 151 ml

Answer: A

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28. The number of $A I^{3+}$ ions in 100 mL of 0.15 M solution of $A I_{2}\left(S O_{4}\right)_{3}$ are:
A. $18 \times 10^{22}$ ions
B. $1.8 \times 10^{22}$ ions
C. $18 \times 10^{24}$ ions
D. $1.8 \times 10^{27}$ ions

## - Watch Video Solution

29. 0.2 g of a primary aliphatic amine, on treatment with nitrous acid gave 61.36 ml of $N_{2}$ gas at STP. The molecular mass of the amine will be:
A. $99 \mathrm{~g} / \mathrm{mole}$
B. $87 \mathrm{~g} / \mathrm{mole}$
C. $73 \mathrm{~g} / \mathrm{mole}$
D. $123 \mathrm{~g} / \mathrm{mole}$

Answer: C
30.10 g of a hydrated salt of $B a C I_{2}$ was dissolved in one litre water. The solution was then treated with 1.65 litre of $0.05 \mathrm{~N} \mathrm{AgNO}_{3}$ till complete precipitation. The number of water molecules in hydrated salt are :
A. 6
B. 10
C. 4
D. 2

Answer: D

- Watch Video Solution

31. A solution of acid having $62 \%$ by mass of acid has specific gravity of 1.8 g . If the solution is to be diluted to attain a specific gravity of 1.2 then what volume of water should be added to 100 ml of this solution?
A. 200 ml
B. 1000 ml
C. 500 ml
D. 300 ml

## Answer: D

32. 20 ml of $C O$ was mixed with 50 ml of $O_{2}$ and the mixture was exploded. On cooling, the resulting mixture was shaken with KOH . Which gas and with what volume is left?
A. $O_{2}, 40 \mathrm{ml}$
B. $O_{2}, 20 \mathrm{ml}$
C. $C O_{2}, 10 \mathrm{ml}$
D. $\mathrm{CO}_{2}, 15 \mathrm{ml}$

## Answer: A

33. Calculate the number of particle in each of the following: 50 g of Mg atom

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34. Calculate the number of particle in each of the following: 100 g of KOH molecules

## - Watch Video Solution

35. Anhydrous sodium sulphate can absorb water vapour and convert to its decahydrate. By how many gram would the mass of a 1 g sample of the thoroughly dried sodium
sulphate increase, if its is exposed to sufficient water vapour to be converted to the decahydrate.
A. 0.85 gm
B. 1.27 gm
C. 3.17 gm
D. 2.42 gm

## Answer: B

## - Watch Video Solution

36.250 ml of $0.10 \mathrm{M} \mathrm{K}_{2} \mathrm{SO}_{4}$ solution is mixed with 250 ml of 0.20 M KCl solution. The concentration of $K^{+}$ions in the resulting solution will be:
A. 0.1 M
B. 0.4 M
C. 0.2 M
D. 0.8 M

## Answer: C

## - Watch Video Solution

37. 3 L mixture of propane and butane on complete combustion at 298 K gave $10 \mathrm{~L} \mathrm{CO}_{2}$ Calculate the compostion of the gas mixture.
A. $C_{3} H_{8}=2$ litre, $C_{4} H_{10}=1$ litre
B. $C_{3} H_{8}=1.5$ litre, $C_{4} H_{10}=1.5$ litre
C. $C_{3} H_{8}=0.5$ litre, $C_{4} H_{10}=2.5$ litre
D. $C_{3} H_{8}=1.75$ litre, $C_{4} H_{10}=1.25$ litre

## Answer: A

## - Watch Video Solution

38. Calculate the number of particle in each of the following: 75 g of K atom.

- Watch Video Solution

39. $\mathrm{H}_{2} \mathrm{O}_{2}$ is reported to be $3.03 \%$ by mass. The strength of $\mathrm{H}_{2} \mathrm{O}_{2}$ in terms of volume of $\mathrm{O}_{2}$ if density of $\mathrm{H}_{2} \mathrm{O}_{2}$ solution is 'd' $\mathrm{g} \mathrm{ml}{ }^{-1}$ will be:
A. 5d' volume
B. 10d' volume
C. 30d' volume
D. 20d' volume

Answer: B
40. Most of the commercial hydrochloric acid is prepared by heating NaCl with conc. $\mathrm{H}_{2} \mathrm{SO}_{4}$ How much sulphuric acid containing $90 \% \mathrm{H}_{2} \mathrm{SO}_{4}$ by mass is needed for the production of 103 kg of hydrochloric acid?
A. 319.55 kg
B. 888.02 kg
C. 153.63 kg
D. 343.28 kg

## Answer: C

## - Watch Video Solution

41. Find number of atoms in 46 g of Na ?

## - Watch Video Solution

42. 100 g of HCI solution with relative density $1.117 \mathrm{~g} / \mathrm{ml}$ contains 33.4 g of HCl . What volume of this HCl solution will be required to exactly neutralize 5 litre of $\mathrm{N} / 10 \mathrm{NaOH}$ solution?
A. 77.8 ml
B. 48.9 ml
C. 23.2 ml
D. 86.2 ml

Answer: B

## - Watch Video Solution

43. The normality of a mixture of HCl and $\mathrm{H}_{2} \mathrm{SO}_{4}$ solution is $\mathrm{N} / 5 \mathrm{Now}, 0.287 \mathrm{~g}$ of AgCl is obtained when 20 ml of the solution is treated with excess of $\mathrm{AgNO}_{3}$. The percentage of both acids in the mixture will be?
A. $H C I=32.44 \%, H_{2} S O_{4}=67.56 \%$
B. $\mathrm{HCI}=42.69 \%, \mathrm{H}_{2} \mathrm{SO}_{4}=57.31 \%$
C. $\mathrm{HCI}=48.75 \%, \mathrm{H}_{2} \mathrm{SO}_{4}=51.25 \%$
D. $\mathrm{HCI}=92.51 \%, \mathrm{H}_{2} \mathrm{SO}_{4}=7.49 \%$

## - Watch Video Solution

44. 1.17 g an impure sample of oxalic acid dihydrate was dissolved and make up of 200 ml with water. 10 ml of this solution in acidic medium required 8.5 ml of a solution of potassium permanganate containing 3.16 g per litre of solution. The percentage purity of oxalic acid will be:
A. 0.1265
B. 0.3578
C. 0.8276
D. 0.9154
45. 2.65 gm of a diacidic base was dissolved in 500 ml of water. Twenty millilitres of this solution required 12 ml of $N$ HCl solution. Calculate the equivalent mass and molucular mass of the base.
A. 35,70
B. 24,48
C. 18, 36
D. 53, 106

Answer: D
46. Some amount of $\mathrm{NH}_{4} \mathrm{CI}$ was boiled with 50 ml of 0.75

N NaOH solution till the reaction was complete. After the completion of the reaction 10 ml of $0.75 \mathrm{~N} \mathrm{H}_{2} \mathrm{SO}_{4}$ was required for the neutralization of the remaining NaOH .

The amount of $\mathrm{NH}_{4} \mathrm{CI}$ taken was:
A. 1.6 gm
B. 1.2 gm
C. 3.2 gm
D. 8.7 gm

## Answer: A

47. 4.0 g of a mixture of Nacl and $\mathrm{Na}_{2} \mathrm{CO}_{3}$ was dissolved in water and volume made up to 250 mL .25 mL of this solution required 50 mL of $\mathrm{N} / 10 \mathrm{HCl}$ for complete neutralisation. Calculate the percentage composition of the original mixture.

$$
\begin{aligned}
& \text { A. } N a C I=63.75 \%, N a_{2} \mathrm{CO}_{3}=36.25 \% \\
& \text { B. } N a C I=55.85 \%, N a_{2} C O_{3}=44.15 \% \\
& \text { C. } N a C I=48.75 \%, N a_{2} C O_{3}=51.25 \% \\
& \text { D. } N a C I=74.75 \%, N a_{2} C O_{3}=25.25 \%
\end{aligned}
$$

## Answer: B

## - Watch Video Solution

48. 25 g of salt are present in 50 g of solution. Calculate the mass percentage of the solute.

## - Watch Video Solution

49. 40 g of salt are dissolved in 120 g of solution. Calculate the mass percentage of solution.

## - Watch Video Solution

50. 2.20 g of an ammonium salt was boild with 74 ml of 1

N NaOH till the emission of ammonia gas ceased. The excess of unused NaOH solution required 70 ml of $\mathrm{N} / 2$ sulphuric acid for neutralization. The percentage of ammonia in the salt is:
A. 0.31
B. 0.83
C. 0.66
D. 0.47

## Answer: A

## D Watch Video Solution

## Impeccable

1. 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. 0.011
B. 0.029
C. 0.044
D. 0.333

Answer: 2

## - Watch Video Solution

2. What is the volume of one molecules of water (density of $\mathrm{H}_{2} \mathrm{O}=1 \mathrm{gcm}^{-3}$ )
A. $3.0 \times 10^{-23} \mathrm{~cm}^{3}$
B. $5.5 \times 10^{23} \mathrm{~cm}^{3}$
C. $9.0 \times 10^{-23} \mathrm{~cm}^{3}$
D. $6.023 \times 10^{-23} \mathrm{~cm}^{3}$

## Answer: 1

## - Watch Video Solution

3. 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. CHO
B. $\mathrm{CH}_{4} \mathrm{O}$
C. $\mathrm{CH}_{3} \mathrm{O}$
D. $\mathrm{CH}_{2} \mathrm{O}$

## Answer: 3

## - Watch Video Solution

4. What volume of oxygen gas $\left(O_{2}\right)$ measured at $0^{\circ} \mathrm{C}$ and

1 atm , is needed to burn completely 1 L of propane gas
$\left(C_{3} H_{8}\right)$ measured under the same conditions?
A. 5 L
B. 10 L
C. 7 L
D. 6 L

## - Watch Video Solution

5. During electrolysis of water, the volume of oxygen liberated is $2.24 \mathrm{dm}^{3}$. The volume of hydrogen liberated, under same conditions will be
A. $2.25 d m^{3}$
B. $1.12 d m^{3}$
C. $4.48 d m^{3}$
D. $0.56 d m^{3}$

Answer: 3
6. Number of moles of $\mathrm{MnO}_{4}^{-}$required to oxidise one mole of ferrous oxalate completely in acidic medium will be
A. 7.5 moles
B. 0.2 mole
C. 0.6 mole
D. 0.4 mole

Answer: 3

- Watch Video Solution

7. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water prodused in this reaction will be
A. 3 moles
B. 4 moles
C. 1 mole
D. 2 moles

Answer: 2

## - Watch Video Solution

8. A bivalent metal has an equivalent mass of 32 . The molecular mass of the metal nitrate is
A. 168
B. 192
C. 188
D. 182

## Answer: 3

## - Watch Video Solution

9. The number of significant figures is 10.3406 g in :
A. 2
B. 3
C. 6
D. 4

## Answer: 5

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10. $1.5 \mathrm{~g} \mathrm{CdCl}_{2}$ was formed to contain 0.9 g Cd . Calculate the atmic weight of Cd .
A. 118
B. 112
C. 106.5
D. 53.25

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11. The volume of $2 \mathrm{~N} \mathrm{H}_{2} \mathrm{SO}_{4}$ solution is $0.1 \mathrm{dm}^{3}$. The volume of its decinormal solution (in $d m^{3}$ ) will be
A. 0.1
B. 0.2
C. 2
D. 1.7

Answer: 3

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12. what volume of $\mathrm{CO}_{2}$ will be liberated at STP if 12 g of carbon is burnt in excess of oxygen ?
A. 11.2 L
B. 22.4 L
C. 2.24 L
D. 1.12 L

Answer: 2

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13. The equivalent mass of $\mathrm{MnSO}_{4}$ is half of its molecular mass when it is converted to
A. $\mathrm{Mn}_{2} \mathrm{O}_{3}$
B. $\mathrm{MnO}_{2}$
C. $\mathrm{MnO}_{4}^{-}$
D. $\mathrm{MnO}_{4}^{2-}$

## Answer: 2

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14. $x$ moles of potassium dichromate oxidizes 1 mole of ferrous oxalate in acidic medium. Here x is :
A. 3
B. 1.5
C. 0.5
D. 1

## Answer: 3

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15. Express of $C O_{2}$ is passed through 50 mL of 0.5 M calcium hydroxide solution. After the completion of the reaction, the solution was evaporated to dryness. The solid calcium carbonated was completely neutralized with
0.1 N hydrochloric acid. The volume of hydrochloric acid required is (At mass of carbon $=40$ )
A. $200 \mathrm{~cm}^{3}$
B. $500 \mathrm{~cm}^{3}$
C. $400 \mathrm{~cm}^{3}$
D. $300 \mathrm{~cm}^{3}$

## Answer: 2

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16. The number of electrons required to reduce $4.5 \times 10^{-5} \mathrm{~g}$ of $A l^{+3}$ is :
A. $1.03 \times 10^{18}$
B. $3.01 \times 10^{18}$
C. $4.95 \times 10^{26}$
D. $7.31 \times 10^{20}$

Answer: 2

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17. How much volume of oxygen at STP in litres is required to burn 4 g of methane gas completely?
A. 11.2
B. 5.6
C. 2.8
D. 8
18. Equivalent weight of Potassiumpermaganate in strong alkaline medium is
A. $\frac{\text { molar mass }}{5}$
B. $\frac{\text { molar mass }}{3}$
C. $\frac{\text { molar mass }}{2}$
D. molar mass itself.

## Answer: 4

19. An organic compound contains $40 \% C, 6.6 \% H$. The empirical formula of the compound is
A. $\mathrm{CH}_{3} \mathrm{O}$
B. $\mathrm{C}_{4} \mathrm{HO}_{4}$
c. CHO
D. $\mathrm{CH}_{2} \mathrm{O}$

## Answer: 4

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$20.1 \mathrm{u}(\mathrm{amu})$ is equal to
A. $1.492 \times 10^{-10} J$
B. $1.492 \times 10^{-7} J$
C. $1.492 \times 10^{-13} J$
D. $6.023 \times 10^{25} J$


## Answer: 1

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21. In the reaction of sodium thiosulphate with $I_{2}$ in aqueous medium, the equivalent mass of sodium sulphate
A. molar mass of sodium thiosulphate
B. the average of molar masses of $N a_{2} S_{2} O_{3}$ and $I_{2}$
C. half the molar mass of sodium thisoulphate
D. molar mass of sodium thisoulphate * 2

## Answer: 1

## - Watch Video Solution

22. A compound ( 60 gm ) on analysis gave $C=24 \mathrm{gm}$ $\mathrm{H}=4 \mathrm{gm}$ and $\mathrm{O}=32 \mathrm{gm}$, its empirical formula is
A. $\mathrm{CH}_{2} \mathrm{O}_{2}$
B. $\mathrm{CH}_{2} \mathrm{O}$
C. $\mathrm{CH}_{4} \mathrm{O}$
D. $\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{O}_{2}$.

## Answer: 2

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23. A mixture of $C a C l_{2}$ and NaCl weighing 4.44 is treated with sodium carbonate solution to precipitate all the $C a^{2+}$ ions as calcium carbonate. The calcium carbonate so obtained is heated strongly to get 0.56 g of CaO . The percentage of NaCl in the mixture of (atomic mass of $C a=40)$ is
A. 75
B. 30.6
C. 25
D. 69.4

## Answer: 1

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24. The number of atoms in 4.25 g of $\mathrm{NH}_{3}$ is approximately
A. $6.023 \times 10^{23}$
B. $4 \times 6.023 \times 10^{23}$
C. $1.7 \times 10^{24}$
D. $4.25 \times 6.023 \times 10^{23}$

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25. In an experiment, 4 g of $M_{2} O_{x}$ oxide was reduced to
2.8 g of the metal. If the atomic mass of the metal is
$56 \mathrm{gmol}^{-1}$, the number of oxygen atoms in the oxide is:
A. 1
B. 2
C. 3
D. 4

Answer: 3
26. The number of molecules in 100 mL of $0.02 \mathrm{~N} \mathrm{H}_{2} \mathrm{SO}_{4}$ is
A. $6.02 \times 10^{22}$
B. $6.02 \times 10^{21}$
C. $6.02 \times 10^{20}$
D. $6.02 \times 10^{18}$

## Answer: 3

27. In the conversion $\mathrm{NH}_{2} \mathrm{OH} \rightarrow \mathrm{N}_{2} \mathrm{O}$, the equivalent weight of $\mathrm{NH}_{2} \mathrm{OH}$ will be:
A. M
B. $M / 2$
C. $M / 4$
D. $M / 5$

Answer: 2

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28. To dissolve 0.9 g metal, 100 mL of 1 N HCl is used. What is the equivalent weight of metal?
A. 7
B. 9
C. 10
D. 6

Answer: 2

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29. The amount of oxalic acid required to prepare 300 mL of 2.5 M solution is: (molar mass of oxalic acid $=90 \mathrm{~g}$ $\left.\operatorname{mol}^{-1}\right)$ :
A. 67.5 g
B. 9.45 g
C. 6.75 g
D. 94.5 g

## Answer: 1

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30. The amount of $H_{2} S$ required to precipitate 1.69 g BaS from $B a C l_{2}$ solution is (Atomic weight $\mathrm{Ba}=137, \mathrm{~S}=32$ and $H=1):$
A. 3.4 g
B. 1.7 g
C. 0.34 g
D. 0.17 g

## Answer: 3

## - Watch Video Solution

31. How many moles of iodine are liberated when one mol of potassium dichromate reacts with excess of potassium iodide in the presence of concentrated sulphuric acid?
A. 1
B. 2
C. 3
D. 4

## Answer: 3

## - Watch Video Solution

32. The number of atoms in 0.1 mole of a triatomic gas is

$$
\left(N_{A}=6.02 \times 10^{23} \mathrm{~mol}^{-1}\right)
$$

A. $6.026 \times 10^{22}$
B. $1.806 \times 10^{23}$
C. $3.6 \times 10^{23}$
D. $1.8 \times 10^{22}$
33. Which has the maximum number of molecules among the following?
A. $44 g \mathrm{CO}_{2}$
B. $48 g O_{2}$
C. $8 g H_{2}$
D. $64 g \mathrm{SO}_{2}$

Answer: 3

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34. 50.0 kg of $N_{2}(\mathrm{~g})$ and 10.0 kg of $H_{2}(\mathrm{~g})$ are mixed to produce $\mathrm{NH}_{3}$ (g). Calculate the amount of $\mathrm{NH}_{3}$ (g) formed. Identify the limiting reagent in the production of

NH3 in this situation
A. 17 kg
B. 34 kg
C. 20 kg
D. 3 kg

## Answer: 1

## 35. Stoichiometric ratio of sodium dihydrogen

 orthophosphate and sodium hydrogen orthophosphate required for synthesis of $N a_{5} P_{3} O_{10}$ isA. $1.5: 3$
B. $3: 1.5$
C. $1: 1$
D. $2: 3$

## Answer: 1

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36. How many grams of concentrated nitric acid solution should be used to prepare 250 mL of $2.0 \mathrm{M} \mathrm{HNO}_{3}$ ? The concentrated acid is $70 \% \mathrm{HNO}_{3}$.
A. 54.0 g conc. $\mathrm{HNO}_{3}$
B. 45.0 g conc. $\mathrm{HNO}_{3}$
C. 90.0 g conc. $\mathrm{HNO}_{3}$
D. 70.0 g conc. $\mathrm{HNO}_{3}$

Answer: 2

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37. If excess of $\mathrm{AgNO}_{3}$ solution is added to 100 mL of a 0.024 M solution of dichlorobis (ethylenediamine ) cobalt (III) chloride , how many moles of AgCl be precipitated?
A. 0.01
B. 0.001
C. 0.002
D. 0.003

Answer: 2
38. $6.02 \times 10^{20}$ molecules of urea are present in 100 mL of its solution. The concentration of urea solution is:
A. 0.1 M
B. 0.02 M
C. 0.01 M
D. 0.001 M

## Answer: 3

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39. 1.0 g of magnesium is burnt with $0.56 \mathrm{~g} O_{2}$ in a closed vessel. Which reactant is left in excess and how much?
(At.wt: $\mathrm{Mg}=24, \mathrm{O}=16$ )
A. Mg .0 .44 g
B. $O_{2}, 0.28 \mathrm{~g}$
C. $M g, 0.16 g$
D. $O_{2}, 0.16 g$

## Answer: 3

## - Watch Video Solution

40. When $22.4 L$ of $H_{2}(g)$ is mixed with 11.2 L of $C l_{2}(g)$, each at STP, the moles of $\mathrm{HCl}(\mathrm{g})$ formed is equal to
A. 0.5 mol of $\mathrm{HCl}(\mathrm{g})$
B. 1.5 mole of $\mathrm{HCl}(\mathrm{g})$
C. 1 mol of $\mathrm{HCl}(\mathrm{g})$
D. 2 mol of $\mathrm{HCl}(\mathrm{g})$

## Answer: 3

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41. The number of water molecules is maximum in
A. 18 gram of water
B. 18 moles of water
C. 18 molecules of water
D. 1.8 gram of water

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42. If Avogadro number $N_{A}$ is changed from $6.022 \times 10^{23} \mathrm{~mol}^{-1}$ to $6.022 \times 10^{20} \mathrm{~mol}^{-1}$, 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

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43. 20.0 g 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 $\mathrm{Mg}=24$ )
A. 60
B. 84
C. 75
D. 96
44. What is the mass of precipitate formed when 50 mL of $16.9 \%$ solution of $\mathrm{AgNO}_{3}$ is mixed with 50 mL of $5.8 \%$ NaCl solution?

$$
(\mathrm{Ag}=107.8, \mathrm{~N}=14, \mathrm{O}=16, \mathrm{Na}=23, \mathrm{Cl}=35.5)
$$

A. 7 g
B. 14 g
C. 28 g
D. 3.5 g

Answer: 1
45. 5.0 g of sodium hydroxide `("molar mass 40 g mol"^(-1)) is dissolved in little quanitity of water and the solution is diluted upto 100 mL . What is the molarity of the resulting solution?
A. $0.1 \mathrm{~mol} d m^{-3}$
B. $1.0 \mathrm{~mol}_{\mathrm{mm}}{ }^{-3}$
C. $0.125 \mathrm{~mol} \mathrm{dm}{ }^{-3}$
D. $1.25 \mathrm{~mol} d m^{-3}$

Answer: 4
46. Suppose elements $X$ and $Y$ combine to form two compounds $X Y_{2}$ and $X_{3} Y_{2}$ when 0.1 mole of former weigh $10 g$ while 0.05 mole of the latter weigh $9 g$. What are the atomic weights of $X$ and $Y$.
A. 40,30
B. 60,40
C. 20, 30
D. 30,20

Answer: 1

## D Watch Video Solution

47. The largest number of molecules in
A. 36 g of $\mathrm{H}_{2} \mathrm{O}$
B. 28 g of $\mathrm{CO}_{2}$
C. 46 g of $\mathrm{CH}_{3} \mathrm{OH}$
D. 54 g of $\mathrm{N}_{2} \mathrm{O}_{5}$

## Answer: 1

## - Watch Video Solution

48. The equivalent weight of a metal is 9 and vapour density of its chloride is 59.25 . The atomic weight of metal is :
A. 23.9
B. 27.3
C. 36.3
D. 48.3

## Answer: 1

## - Watch Video Solution

49. In an oxidation-reduction reaction, $\mathrm{MnO}_{4}^{-}$ion is converted to $M n^{+2}$. What is the number of equivalents of $\mathrm{KMnO}_{4}$ (molecular weight $=158$ ) present in 250 mL of $0.04 \mathrm{M} \mathrm{KMnO}_{4}$ solution?
A. 0.02
B. 0.05
C. 0.04
D. 0.07

Answer: 2

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