CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 11 FOR CHEMISTRY

SOME BASIC CONCEPTS IN CHEMISTRY

STOICHIOMETRY (PART-I)

CUQ

1. Which of the following is not a homgeneous mixture.

A. Air

B. Brass

C. Solution of sugar in water

D. Smoke

Answer: D

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2. Which of the following is not an element.

A. Diamond

B. Silica

C. Tungsten

D. Graphite

Answer: B

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3. The second most abundant element in the earth crust is

A. Oxygen

B. Aluminium

C. Hydrogen

D. Silicon

Answer: D

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4. Which among of the following is an element ?

A. 22 carat gold

B. German silver

C. Graphite

D. Dry ice

Answer: C

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5. Which of the following units represent the largest amount of energy?

A. Calorie

B. Erg

C. Joule

D. Electron-volt

Answer: A

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6. The M.K.S system was first introduced by

A. Archimedes

B. Galileo

C. Newton

D. Giorgi

Answer: D

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7. Which is larger quantity.

A. Mega

B. Femto

C. Milli

D. Giga

Answer: D

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8. Dimensions of pressure are same as that of

A. Energy

B. Force

C. Energy per unit volume

D. Force per unit volume

Answer: C

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9. The prefix 10^{18} is

A. Giga

B. Nano

C. Mega

D. Exa

Answer: D

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10. The number of significant figures in 10500 are

A. Three

B. four

C. Five

D. can be any of these

Answer: D

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11. The number of significant figures in 10500 are

A. Three

B. Four

C. Five

D. Can be any of these

Answer: D

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12. 5.041 has how many significant figures.

A. 1

B. 2

C. 3

D. 4

Answer: D

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13. According to Avogadro, equal volumes of two different gases under same conditions of temperature and pressure contain equal number of

A. Atoms

B. Molecules

C. Electrons

D. Protons

Answer: B

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14. In Habers process, the volume at S.T.P. of ammonia relative to the total volume of reactants at STP is:

A. One fourth

B. One half

C. Same

D. Three fourth

Answer: B

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15. One part of element A reacts with two parts of another element B. 6 parts of element C reacts with 4 parts of element

B. If A and C combine together, the ratio of their weights be governed by

A. Law of definite proportion

B. Law of multiple proportion

C. Law of reciprocal proportion

D. Law of conservation of mass

Answer: C

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

A. All chemical reactions

B. Nuclear reactions

C. Endo thermic reactions

D. Exo thermic reactions

Answer: B

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17. The % of copper and oxygen in samples of CuO obtained by different methods were found to be the same. This proves the law of:

A. Constant Proportion

B. Reciprocal Proportion

C. Multiple Proportion

D. Conservation of mass

Answer: A

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18. The mass of nitrogen per gram in hydrazine is exactly one and half the mass of nitrogen in the compound ammonia. The fact illustrates the

A. Law of conservation of mass

B. Multiple valency of nitrogen

C. Law of multiple proportion

D. Law of definite proportion

Answer: C

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19. A balanced chemical equation is in accordance with

A. Multiple proportion

B. Reciprocal proportion

C. Conservation of mass

D. Definite proportions

Answer: C

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20. The law of multiple proportions was observed for the pair

A. CO_2, NO_2

B. N_2O, NO_2

C. H_2O, H_2S

D. H_2S, SO_2

Answer: B

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21. An unbalanced chemical equation is against the law of

A. The law of gaseous volumes

B. The law of constant proportions

C. The law of mass action

D. The law of conservation of mass

Answer: D

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22. Law of combining volumes was proposed by

A. Lavoisier

B. Gay Lussac

C. Avogadro

D. Dalton

Answer: B

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23. "The total mass of reactants is always equal to the total mass of products in a chemical reaction." This statement is

known as

A. Law of conservation of mass

B. Law of definite proportions

C. Law of equivalent weights

D. Law of combining masses

Answer: A

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24. In the reaction, Hydrogen(g)+ Oxygen (g) → watervapour, the ratio of volumes is 2:1:2:. This illustrates the law of

A. Conservation of mass

B. Combining weights

C. Combining volumes

D. All the above

Answer: C

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25. Law of multiple proportion is illustrated by:

A. Sodium chloride and sodium bromide

B. Ordinary water and heavy water

C. Caustic soda and caustic potash

D. Sulphur dioxide and sulphur trioxide

Answer: D

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26. Which of the following is an octa-atomic molecule

A. Phosphorus

B. Sulphur

C. Methane

D. Oxygen

Answer: B

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27. Which of the following is a penta-atomic molecule

A. Phosphorus

B. Sulphur

C. Ethane

D. Methane

Answer: D

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28. If we assume $1/24$ th part of mass of carbon instead of $1/12$ th part of it as 1 amu, mass of 1 mole of a substance will

A. Remain unchanged

B. Get doubled

C. Get halved

D. Can't be predicated

Answer: A

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29. Choose the correct statement The use of $.^{12}C$ scale has superseded the older scale of atomic mass based on $.^{16}O$ isotope, one important advantage of the former being

A. The atomic masses on $.^{12}C$ scale became whole numbers.

B. $.^{12}C$ is more abundant in the earth's crust than $.^{16}O$

C. The difference between the physical and chemical atomic masses got narrowed down significantly

D. $.^{12}C$ is situated midway between metals and nonmetals in the periodic table

Answer: A

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30. Which one of the following properties of an element is not variable ?

A. Valency

B. Atomic weight

C. Equivalent Mass

D. All the above

Answer: B

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31. 10 grams of each O_2, N_2 and Cl_2 are kept in three bottles. The correct order of arrangement of bottles containing decreasing number of Molecules.

A. O_2, N_2, Cl_2

B. Cl_2, N_2, O_2

C. Cl_2, O_2, N_2

D. N_2, O_2, Cl_2

Answer: D

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32. The atomicity of a species is x and its atomic weight is y. The molecular weight of the species is

A. $x + y$

B. $y + x$

C. xy

D. x-y

Answer: C

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33. Avagadro's number is the number of molecules present in

A. 1G of molecule

B. 1 Atom of molecule

C. Gram molecular mass

D. 1 Litre of molecules

Answer: C

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34. Atomicity is the number of

A. Protons present in the atom

B. Neutrons present in the atom

C. Atoms present in the molecule

D. Atoms present in 1 gram mole of a substance

Answer: C

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35. On amu is equal to

A. $1.33x10^{-8}g$

B. $1.66x10^{-4}g$

C. $1.66x10^{-16}g$

D. $1.66x10^{-24}g$

Answer: D

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36. The number of molecules present in one milli litre of a gas at STP is known as

A. Avogadro number

B. Boltzman number

C. Loschmidt number

D. Methane

Answer: C

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37. The vapour density of gas is 22. it cannot be

A. Carbon dioxide

B. Nitrous oxide

C. Propane

D. Methane

Answer: D

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38. The mass of $112cm^3$ of methane at STP

A. $0.16g$

B. $0.08g$

C. $0.8g$

D. $16g$

Answer: B

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39. The vapour density of a gas is 11.2. The volume occupied by 11.2 gms of the gas at S.T.P is

A. 11.2 lit

B. 4 lit

C. 2 lit

D. 22.4 lit

Answer: A

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40. Substance having more number of moles is

A. 90 gms of water

B. 112 litre of hydrogen at S.T.P

C. 24 gm of helium gas

D. 3.01×10^{24} molecules of CO_2

Answer: C

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41. Atomicity of oleum $\left(H_2S_2O_7\right)$ is

A. 11

B. 8

C. 7

D. 18

Answer: A

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42. Equivalent weight of Calcium metal is

A. 12

B. 24

C. 36

D. 20

Answer: D

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43. Equivalent weight of Potassiumpermaganate in strong alkaline medium is

A. M.W/1

B. M.W/3

C. M.W/5

D. M.W/6

Answer: A

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44. Equivalent weight of N_2H_4 is

A. 32

B. 16

C. 48

D. 24

Answer: B

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45. Equivalent weight of H_2S is equal to the equivalent weight of

A. HCl

B. H_2O_2

C. H_2SO_2

D. H_2O

Answer: B

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46. The number of parts by mass of the element or compound which combines or displaces directly or indirectly one part by mass of Hydrogen is called

A. Atomic mass

B. Molecular mass

C. Equivalent mass

D. Formula weight

Answer: C

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47. Equivalent weight of oxidizing or reducing agent is

A. $\frac{\text{Formula weight}}{\text{No. of } e^{-1} \text{ gained(or)lossed for one formulae of compound}}$

B. $\frac{\text{Formula weight}}{\text{Total change in oxidation state for one formula of compound}}$

C. Both 1 & 2

D. $\frac{\text{Formula weight}}{\text{Valency}}$

Answer: C

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48. Equivalent weight of Ferrous ion is (At.wt.of Fe = 56)

A. 56

B. 28

C. 14

D. 32

Answer: B

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49. For which of the following salt, Eq.wt is F.W/6

A. $NaCI$

B. K_2SO_4

C. $Fe_2\left(SO_4\right)_3$

D. $AlCl_3$

Answer: C

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50. Equivalent weight of NH_4OH is

A. 35

B. 17.5

C. 42

D. 72

Answer: A

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51. Equivalent weight of $CaCI_2$ is

A. $\frac{\text{Formula weight}}{2}$

B. $\frac{\text{Formula weight}}{1}$

C. $\frac{\text{Formula weight}}{3}$

D. $\frac{\text{Formula weight}}{4}$

Answer: A

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52. Equivalent weight of hydrated oxialic acid is

A. 44

B. 45

C. 63

D. 126

Answer: C

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53. The emperical formula of Acetic acid is

A. CH_3 - $COOH$

B. C_2H_4O

C. CH_2O

D. CHO

Answer: C

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54. The empirical formula of a compound is CH_2. IF one mole of the compound has a mass of $42g$, its molecular formula is

A. CH_2

B. C_2H_2

C. C_3H_6

D. C_3H_8

Answer: C

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55. In the reaction:

$$2Al_{(s)} + 6HCl_{(aq.)} \rightarrow 2Al^{3+}_{(aq.)} + 6Cl^{-}_{(aq.)} + 3H_{2(g)}$$

A. 11.2L of $H_2(g)$ at STP is produced for every mole $HCI_{(aq)}$ consumed

B. $6HCl_{(aq)}$ is consumed for every 3L of $H_{2(g)}$ produced

C. 33.6L of $H_{2(g)}$ is produced regardless of temperature and pressure for every mole Al that reacts

D. $67.2L$ of $H_{2(g)}$ at STP is produced for every mole Al reacts

Answer: C

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56. Which is not affected by temperature?

A. Molality

B. Molarity

C. Normality

D. None of these

Answer: B

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57. A molar solution is one that contains one mole of the solute in

A. 100 gm of solvent

B. One litre of the solvent

C. 1000 gm of solvent

D. One litre of the solution

Answer: D

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58. On dissolving 1 mole of each of the following acids in 1 litre water, the acid which does not give a solution of strength 1N is -

A. HCl

B. $HClO_4$

C. HNO_3

D. H_3PO_4

Answer: D

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59. Iron in lowest oxidation state is in

A. $FeSO_4.7H_2O$

B. $Fe(CO)_5$

C. $Fe_{0.94}O$

D. Fe_3O_4

Answer: B

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60. Oxidation state of nitrogen is not an integer in

A. Hydroxyl amine $\left(NH_2OH\right)$

B. Ammonia $\left(NH_3\right)$

C. Hydrazine $\left(N_2H_4\right)$

D. Hydrazoic acid $\left(N_3H\right)$

Answer: D

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61. The oxidation state of phosphorus is maximum in

A. Phospine $\left(PH_3\right)$

B. Diphosphine $\left(P_2H_4\right)$

C. Metaphosphoric acid $\left(HPO_3\right)$

D. Phosphorus acid $\left(H_3PO_3\right)$

Answer: C

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62. The oxidation state of oxygen is maximum in

A. Bleaching powder $\left(CaOCI_2\right)$

B. Oxygen difluoride $\left(OF_2\right)$

C. Dioxygen difluoride $\left(O_2F_2\right)$

D. Hydrogen peroxide $\left(H_2O_2\right)$

Answer: B

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63. The oxidation number of chlorine is maximum in

A. $HOCI$

B. CI_2O_6

C. $KCIO_4$

D. $NaCIO_3$

Answer: C

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64. One of the following element always exhibits only-1 oxidation state in all of its compounds with other elements.

The element is

A. Hydrogen

B. Sodium

C. Fluorine

D. Oxygen

Answer: C

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65. In one of the following compounds, the oxidation number of sulphur is not a whole numbers

A. $Na_2S_4O_6$

B. H_2SO_5

C. H_2SO_4

D. $Na_2S_2O_3$

Answer: A

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66. Bromine reacts with hot aqueous alkali to give bromide and bromate. What is the change that is brought about in oxidation state to bromine to bromate?

A. 0 to +1

B. 0 to +3

C. 0 to +5

D. 0 to +7

Answer: C

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67. Which of the following statements is wrong ?

A. Oxidation number of oxygen is +1 in peroxides

B. Oxidation number of oxygen is +2 in oxygen difluoride

C. Oxidation number of oxygen is $-1/2$ in super oxides

D. Oxidation number of oxygen is -2 in most of its compounds

Answer: A

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68. The conversion of Glucose to carbon dioxide with respect to carbon is

A. Oxidation

B. Reduction

C. both oxidation & rection

D. Neither oxidation nor reduction

Answer: A

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69. In the reaction $P + NaOH \rightarrow PH_3 + NaH_2PO_2$

A. P is oxidised only

B. P is reduced only

C. Na is reduced

D. P is reduced as well as oxidised

Answer: D

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70. Which of the following can be used both as an oxidant and a reductant?

A. SO_2

B. CrO_3

C. SO_3

D. Al_2O_3

Answer: A

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71. Which does not undergo comproportionation reaction?

A. $Cl_{2(g)} + OH^{-}_{(aq)} \rightarrow ClO^{-}_{3(aq)} + Cl^{-}_{(aq)} + H_2O_{(l)}$

B. $Ag^{2+}_{(aq)} + Ag_{(s)} \rightarrow 2Ag^{+}_{(aq)}$

C. $Na_{(s)} + H_2O_{(i)} \rightarrow NaOH_{(aq)} + H_{2(g)}$

D. $Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$

Answer: B

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72. Which of the following is not disproportionation reaction.

A. $P_{4_{(s)}} + OH^{-}_{(aq)} \rightarrow PH_{3(g)} + H_2PO^{-}_{2(aq)}$

B. $S_{(s)} + OH^{-}_{(aq)} \rightarrow S^{-2}_{(aq)} + S_2O^{2-}_{3(aq)} + H_2O(l)$

C. $Cl_{2((g))} + OH^{-}_{(aq)} \rightarrow ClO^{-}_{(aq)} + H_2O_{(l)}$

D. $F_{2(g)} + OH^{-}_{(aq)} \rightarrow F^{-}_{(aq)} + OF_{2(g)} + H_2O_{(l)}$

Answer: D

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73. The oxidation number of Oxygen in KO_2 is

A. -2

B. -1

C. $-1/2$

D. $-1/3$

Answer: C

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74. The oxidation number and covalency of sulphur in the sulphur molecule $\left(S_8\right)$ are respectively:

A. 6 & 8

B. 0 & 8

C. 0 & 2

D. 6 & 2

Answer: C

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75. $Na_2SO_3 + H_2O_2 \rightarrow Na_2SO_4 + H_2O$, in reaction

A. H_2O_2 is bleached

B. H_2O_2 is reduced

C. H_2O_2 is dehydrated

D. H_2O_2 is neither oxidised nor reduced

Answer: B

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76. In which of the following compounds, sulphur atom has different oxidation number

A. H_2SO_4

B. HSO_3^-

C. SO_2CI_2

D. SO_3

Answer: B

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77. Change in oxidation number is maximum in the following reaction

A. $Cu + 4HNO_3 \rightarrow Cu\left(NO_3\right)_2 + 2NO_2 + 2H_2O$

B. $H_2S + 4F_2 \rightarrow 2HF + SF_6$

C. $CI_2 + 2KOH \rightarrow KCl + KOCl + H_2O$

D. $KClO_3 + H_2O + F_2 \rightarrow KClO_2 + 2HF$

Answer: B

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78. Which of the following is a redox reaction

A. $CH_3COOH + C_2H_5OH \rightarrow CH_3COOC_2H_5 + H_2O$

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

C. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

D. $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

Answer: C

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79. Which of the following are neutral oxide?

A. $K_2Cr_2O_7$

B. $KMnO_4$

C. Cl_2

D. CrO_3

Answer: B

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80. The oxidation state of N in HNO_4 is

A. $+7$

B. $+10$

C. $+5$

D. $+3$

Answer: C

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81. Which of the following can acts as a reducing agent ?

A. $K_2Cr_2O_7$

B. $CaOCl_2$

C. PbO_2

D. H_2S

Answer: D

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82. Which of the following is displacement reaction :

A. $S_{(s)} + O_{2(g)} \rightarrow SO_{2(g)}$

B. $KClO_{3(a)} \rightarrow KCl_{(s)} + O_{2(g)}$

C. $Ca_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)} + H_{2(g)}$

D. $F_{2_{(g)}} + OH^-_{(aq)} \rightarrow F^-_{(aq)} + OF_{2(g)} + H_2O_{(l)}$

Answer: C

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LEVEL-I(C.W)

1. Nkg^{-1} is the unit of :

A. Momentum

B. Velocity

C. Pressure

D. Acceleration

Answer: D

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2. Prefix zepto and femto stands for which multiples ?

A. 10^{9}

B. 10^{-12}

C. 10^{-15}

D. 10^{5}

Answer: C

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3. The number of significant figures in $N_0 = 6.022 \times 10^{23}$ (Avogadro's number) are

A. Three

B. Four

C. Five

D. All

Answer: B

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4. The correctly reported answer of the addition of 4.523, 2.3 and 6.24 will have significant figures

A. Two

B. Three

C. Four

D. Five

Answer: B

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5. The answer of the calculation $\frac{2.568 \times 5.8}{4.168}$ in significant figures will be :

A. 3.579

B. 3.570

C. 3.57

D. 3.6

Answer: D

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6. How many significant figures are present in the following ?

(i) 0.0025

(ii) 208

(iii) 126,000

(v) 600.0

(vi) 3.0034.

A. 6

B. 3

C. -4

D. 2

Answer: D

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7. 314.000 has how many significant figures.

A. 6

B. 3

C. 5

D. 4

Answer: A

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8. The correctly reported difference of 16.4215 and 6.01 will have significant figures equal to

A. Three

B. Four

C. Five

D. Six

Answer: B

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9. After rounding off 1.235 and 1.225, we will have their answer respectively as

A. 1.23, 1.22

B. 1.24, 1.23

C. 1.23, 1.23

D. 1.24,1.22

Answer: D

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10. In the formation of SO_2 and SO_3 the ratio of the weights of oxygen which combines with 10 kg of sulphur is

A. $1:1$

B. $3:2$

C. $2:3$

D. $3:4$

Answer: C

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11. $14gm$ of element X combine with $16gm$ of oxygen. On the basis of this information, which of the following is the correct statement .

(a). The element 'X' could have atomic weight of 7 and its's oxide the formula XO

(b). The element 'X' could have atomic weight of 14 and its's oxide the formula X_2O

(c). The element 'X' could have atomic weight of 7 and its's oxide the formula X_2O

(d). The element 'X' could have atomic weight of 14 and its's oxide the formula X_2O

A. The element X could have an atomic weight of 7 and its oxide formula is XO.

B. The element X could have an atomic weight 14 and it's oxide formula X_2O_3

C. The element X could have an atomic weight 7 and it's oxide formula X_2O

D. The element X could have an atomic weight 14 and it's oxide formula XO_2

Answer: C

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12. Law of multiple proportions is illustrated by one of the following pairs.

A. H_2S and SO_2

B. NH_3 and NO_2

C. Na_2S and Na_2O

D. N_2O and NO

Answer: D

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13. Percentage of copper and oxygen in samples of CuO obtained by different methods were found to be same. This proves the law of

A. Constant proportions

B. Reciprocal proportion

C. Multiple proportion

D. Conservation of mass

Answer: A

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14. A sample of pure carbon dioxide, irrespective of its source contains 27.27% carbon and 72.73% oxygen. The data support

A. Law of constant composition

B. Law of conservation of mass

C. Law of reciprocal proportions

D. Law of multiple proportions

Answer: A

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15. Boron has two istopes B^{10} & B^{11} whose relative abundances are $20\ \%$ & $80\ \%$ respectively avg.atomic weight of Boron is?

A. 10

B. 11

C. 10.5

D. 10.8

Answer: D

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16. Which of the following has highest mass

A. 50 gms of iron

B. 5 moles of nitrogen

C. 1 gm atom of silver

D. 5×10^{23} atoms of carbon

Answer: B

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17. 1.5 moles of oxygen atoms are present in

A. 0.5 moles of $BaCO_3$

B. 1 mole of $BaCO_3$

C. 2 moles of $BaCO_3$

D. 0.25 moles of $BaCO_3$

Answer: A

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18. The number of atoms in 4.25 g of NH_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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19. 12 gm of an alkaline earth metal gives 14.8 g of its nitride. The atomic mass of metal is

A. 12

B. 24

C. 20

D. 40

Answer: D

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20. The isotopes of chlorine with mass numbers 35 and 37 exist in the ratio of

A. 1 : 1

B. $2:1$

C. $3:1$

D. $3:2$

Answer: C

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21. The gas having same number of molecules as 16g of oxygen is

A. 16g of O_3

B. 16g of SO_3

C. 48g of SO_3

D. 1 gm of hydrogen

Answer: D

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22. The weight of gaseous mixture containing 6.02×10^{23} molecules of nitrogen and 3.01×10^{23} molecules of sulphur dioxide are

A. 46

B. 92

C. 60

D. 30

Answer: C

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23. The density of a gas at S.T.P is 1.50 grams per litre. The molecular weight of the gas is

A. 28

B. 30

C. 33.6

D. 35

Answer: C

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24. The no of electrons present in one mole of Azide ion are $\left(N_3^-\right)$

A. 21 N

B. 20N

C. 22N

D. 43N

Answer: C

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25. If the mass of an electron is 9×10^{-28} grams weight of one mole of electron is

A. $9 \times 10^{-28} gm$

B. 6×10^{-28}

C. $1.008 gm$

D. $0.00054 gm$

Answer: D

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26. If the weight of 5.6 litres of a gas at $N.T.P.$ is 11 gram. The gas may be :

A. Phosphine

B. Phosgene

C. Nitric oxide

D. Nitrous oxide

Answer: D

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27. Number of milli moles in 1.0 gram of water

A. 1.0

B. 18

C. 55.55

D. 100

Answer: C

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28. Which of the following contains maximum number of molecules

A. 4gm of hydrogen

B. 22.4 ltrs of oxygen at S.T.P

C. Carbon Dioxide obtained by heating 1 mole of calcium carbonate

D. 4gm of helium

Answer: A

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29. A pair of gases having same number of molecules are

A. 22 gm of CO_2 and 72 gm of N_2

B. 11 gm of CO_2 and 28 gm of N_2

C. 44 gm of CO_2 and 7 gm of N_2

D. 11 gm of CO_2 and 7 gm of N_2

Answer: D

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30. The total volume of mixture of 2 gms of helium and 7 gms of nitrogen under S.T.P comditions is

A. 22.4 lit

B. 11.2 lit

C. 16.8 lit

D. 5.6 lit

Answer: C

Watch Video Solution

31. The number of atoms present in 10 gms of $CaCO_3$ are

A. $5N^3$

B. 0.5N

C. 5

D. N

Answer: B

Watch Video Solution

32. How many molecules are present in one in one gram of hydrogen?

A. 6.02×10^{23}

B. 3.01×10^{23}

C. 2.25×10^{23}

D. 1.5×10^{23}

Answer: B

Watch Video Solution

33. The mass of 1.205×10^{22} molecules of ammonia is

A. $0.34g$

B. $3.4g$

C. $3.4kg$

D. $34g$

Answer: A

Watch Video Solution

34. Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is

A. 8

B. 16

C. 64.8

D. 32

Answer: B

Watch Video Solution

35. For which of the following compound equivalent weight is equal to molecular weight

A. H_2SO_4

B. H_3PO_2

C. H_3PO_4

D. H_3PO_3

Answer: B

Watch Video Solution

36. The equivalent weight of phosphoric acid $\left(H_3PO_4\right)$ in the reaction $NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$ is

A. 49

B. 98

C. 32.6

D. 40

Answer: B

Watch Video Solution

37. In alkaline medium , $KMnO_4$ reacts as follows

$2KMnO_4 + 2KOH \rightarrow 2K_2MnO_4 + H_2O + O$

Therefore, the equivalent mass of $KMnO_4$ will be

A. 3.16

B. 52.7

C. 7.0

D. 158.0

Answer: D

Watch Video Solution

38. The equivalent mass of nitrogen in nitrogen pentoxide is

A. 14

B. 28

C. 2.8

D. 4.66

Answer: C

Watch Video Solution

39. Equivalent weight of HI is

A. 64

B. 127

C. 128

D. 63

Answer: C

Watch Video Solution

40. The percentage of Carbon in CO_2 is

A. 27.27 %

B. 29.27 %

C. 30.27 %

D. 26.97 %

Answer: A

Watch Video Solution

41. A compound has 20% of nitrogen by weight. If one molecule of the compound contains two nitrogen atoms, the molecular weight of the compound is

A. 35

B. 70

C. 140

D. 280

Answer: C

Watch Video Solution

42. Haemoglobin contains $0.33\ \%$ of Fe by weight. If 1 molecule of Haemoglobin contains two Fe atoms, the molecular weight of Haemoglobin will be (at.wt of Fe = 56) nearly

A. 67000

B. 34000

C. 17000

D. 20000

Answer: B

Watch Video Solution

43. X and Y are two different elements having their atomic masses in 1:2 ratio. The compound formed by the combination

of X and Y contains 50% of X by weight. The empirical formula of the compound is

A. X_2Y

B. XY_2

C. XY

D. X_4Y

Answer: A

Watch Video Solution

44. A gaseous hydrocarbon with empirical formula CH_2 has a density of 12.5 g gL^{-1} at N.T.P The molecular formula of the compound is

A. C_2H_4

B. C_3H_6

C. C_6H_{12}

D. C_4H_8

Answer: A

Watch Video Solution

45. Empirical formula of a compound is CH_2O and its vapour density is 30. Molecular formula of the compound is

A. CH_2O

B. $C_2H_4O_2$

C. $C_3H_6O_3$

D. $C_6H_{12}O_6$

Answer: C

Watch Video Solution

46. A compound contains 92.3% of carbon and 7.7% of hydrogen. The moleculer of the compound is 39 times heavier than hydrogen molecule. The molecular formula of the compound is

A. C_3H_3

B. C_2H_2

C. C_2H_4

D. C_6H_6

Answer: D

Watch Video Solution

47. $0.132g$ of an organic compound gave 50 ml of N_2 at STP. The weight percentage of nitrogen in the compound is close to

A. 15

B. 20

C. 48.9

D. 47.34

Answer: D

Watch Video Solution

48. In a compound C, H, N atoms are present in $9:1:3.5$ by weight. Molecular weight of compound is 108. Its molecular

formula is:

A. $C_2H_6N_2$

B. C_3H_4N

C. $C_6H_8N_2$

D. $C_9H_{12}N_3$

Answer: C

Watch Video Solution

49. A certain compound contains Calcium, Carbon and Nitrogen in the mass ratio, 20 : 6 : 14. The empirical formula of the compound is

A. $CaCN$

B. CaC_2N

C. $CaC_2\left(CN_2\right)$

D. $CaCN_2$

Answer: D

Watch Video Solution

50. The atomic mass of a metal M is 56, then the empirical formulae of its oxide containing 70% metal

A. MO

B. M_2O_3

C. M_3O_2

D. M_3O_5

Answer: B

Watch Video Solution

51. The pair of species having same percentage of carbon is:

A. CH_3COOH and $C_6H_{12}O_6$

B. CH_3COOH and C_2H_5OH

C. $HCOOCH_3$ and $C_{12}H_{22}O_{11}$

D. $C_6H_{12}O_{16}$ and $C_{12}H_{22}O_{11}$

Answer: A

Watch Video Solution

52. How many grams of H_3PO_4 is required to completely neutralize 120 g of $NaOH$

A. 49

B. 98

C. 196

D. 9.8

Answer: B

Watch Video Solution

53. How much volume of CO_2 at S.T.P. is liberated by the combustion of $100cm^3$ of propane $\left(C_3H_8\right)$?

A. $100cm^3$

B. $200cm^3$

C. $300cm^3$

D. $400cm^3$

Answer: C

Watch Video Solution

54. 30g Mg and 30g O_2 are reacted and the residual mixture contains:

A. $40gMgO + 20gO_2$

B. $45gMgO + 15HO_2$

C. $50gMgO + 10gO_2$

D. $60gMgO$ only

Answer: C

Watch Video Solution

55. If 5ml of methane is completely burnt the volume of oxygen required and the volume of CO_2 formed under the same conditions are

A. 5ml, 10ml

B. 10 ml, 5ml

C. 5ml, 15ml

D. 10 ml, 10ml

Answer: B

View Text Solution

56. If 0.5 mole of $BaCl_2$ are mixed with 0.2 mole of Na_3PO_4,the maximum number of moles. Of $Ba_3\left(PO_4\_(2)\right)$ that can be formed, is

A. 0.7

B. 0.5

C. 0.3

D. 0.1

Answer: D

Watch Video Solution

57. $KClO_3$ on heating decomposes to give KCl and O_2. What is the volume of O_2 at N.T.P liberated by 0.1 mole of $KClO_3$?

A. $7.45g$

B. $2.48g$

C. $4.96g$

D. $1.24g$

Answer: B

Watch Video Solution

58. 23 g of sodium will react with methanol to give

A. 1 mole of H_2

B. $1/2$ mole of H_2

C. 1 mole of O_2

D. 1 mole of $NaOH$

Answer: B

Watch Video Solution

59. How many litres of oxygen at STP are required for complete combustion of 39 gms of liquid Benzene? (Atomic weights $C = 12, H = 1, O = 16$)

A. 84

B. 22.4

C. 42

D. 11.2

Answer: A

Watch Video Solution

60. what volume of hydrogen gas , at 273 K and 1 atm pressure will be consumed in obtaining 21.6 g of elemental boron (atomic mass=10.8) from the reduction of boron trichloride by hydrogen ?

A. 89.6L

B. 67.2L

C. 44.8L

D. 22.4L

Answer: B

Watch Video Solution

61. The weight of $KMnO_4$ required to completely oxidise 0.25 moles of $FeSO_4$ in acid medium is.....(molecular weight of $KMnO_4 = 158$)

A. 5.8

B. 1.5

C. 7.9

D. 0.79

Answer: C

Watch Video Solution

62. How many moles of potassium chlorate need to be heated to produce 11.2 litres of oxygen at NTP?

A. 3

B. 4

C. 1

D. 2

Answer: D

Watch Video Solution

63. 0.01 mole of iodoform $\left(CHI_3\right)$ reacts with Ag to produce a gas whose volume at NTP is

$$2CHI_3 + 6Ag \rightarrow 6AgI(s) + C_2H_2(g)$$

A. 224 ml

B. 112 ml

C. 336 ml

D. 448 ml

Answer: B

Watch Video Solution

64. What weight of sodium hydroxide is required to neutralise 100 ml of $0.1NHCl$?

A. 4g

B. 0.4g

C. 0.04g

D. 40g

Answer: B

Watch Video Solution

65. H_2O_2 solution used for hair bleaching is sold as a solution of approximately 5.0 g H_2O_2 per 100 mL of the solution. The molecular mass of H_2O_2 is 34. The molarity of this solution is approximately

A. 0.15M

B. 1.5M

C. 3.0M

D. 3.4M

Answer: B

Watch Video Solution

66. The amount of oxalic acid (eq. wt 63) required to preare 500 ml of its 0.10 N solution is

A. $0.315g$

B. $3.150g$

C. $6.300g$

D. $63.00g$

Answer: B

Watch Video Solution

67. The molarity of a solution having 18g of glucose dissolved in 500 g of water is

A. 1m

B. 0.5m

C. 0.2m

D. 2m

Answer: C

Watch Video Solution

68. If 5.85 g of $NaCl$ is dissolved in 90g of water, the mole fraction of solute is

A. 0.0196

B. 0.01

C. 0.1

D. 0.2

Answer: A

Watch Video Solution

69. Mass percentage (w/w) of ethylene glycol $\left(HOCH_2 - CH_2OH\right)$ in a aqueous solution is 20, then mole fraction of solute is

A. 0.5

B. 0.067

C. 0.1

D. 0.4

Answer: B

Watch Video Solution

70. 100 ml of ethylalcohol is made upon a litre with distilled water. If the density of C_2H_5OH is $0.46gr/ml$. Then its molarity is

A. $0.55m$

B. $111m$

C. $2.22m$

D. $3.33m$

Answer: B

Watch Video Solution

71. $10cm^3$ of 0.1N monobasic acid requires $15cm^3$ of sodium hydroxide solution whose normality is

A. $0.066N$

B. $0.66N$

C. $1.5N$

D. $0.15N$

Answer: A

Watch Video Solution

72. The molarity of $0.6N$ phosphorous acid is

A. 0.3

B. 0.1

C. 0.9

D. 0.6

Answer: A

Watch Video Solution

73. $50mL$ of $10NH_2SO_4$, $25mL$ of $12NHCI$ and $40mL$ of $5NHNO_3$ are mixed and the volume of the mixture is made 1000 mL by adding water. The normality of resulting solution will be

A. 1N

B. 2N

C. 3N

D. 4N

Answer: A

Watch Video Solution

74. On dissolving 1 mole of each of the following acids in 1 litre water, the acid which does not give a solution of strength 1N is -

A. HCl

B. $HClO_4$

C. HNO_3

D. H_3PO_4

Answer: D

Watch Video Solution

75. Oxidation number of iron $Na_2\left[Fe(CN)_5\left(NO^+\right)\right]$ is :

A. $+1$

B. $+2$

C. 0

D. $+3$

Answer: B

Watch Video Solution

76. Oxidation number of carbon in carbon suboxide $\left(C_3O_2\right)$ is :

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

B. $\frac{+4}{3}$

C. $+4$

D. $\frac{-4}{3}$

Answer: B

Watch Video Solution

77. What is the oxidation state of sodium in sodium amalgam (Na/Hg)?

A. $+2$

B. $+1$

C. -2

D. 0

Answer: D

Watch Video Solution

78. The oxidation number of Fe in $Fe_{0.94}O$ is

A. 200

B. $200/94$

C. $94/200$

D. None

Answer: B

Watch Video Solution

79. Oxidation number of S in $\left(CH_3\right)_2S$ is

A. 0

B. $+1$

C. -2

D. $+3$

Answer: C

Watch Video Solution

80. Oxidation number of 'Co' in $Hg\left[Co(SCN)_4\right]$

A. $+2$

B. $+1$

C. $+3$

D. $+5$

Answer: A

Watch Video Solution

81. Oxygen can show positive oxidation state in its compounds with

A. Fluorine

B. Nitrogen

C. Hydrogen

D. Sulphur

Answer: A

Watch Video Solution

82. which of the following is a redox reaction ?

A. $NaCl + KNO_3 \rightarrow NaNO_3 + KCl$

B. $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$

C. $Mg(OH)_2 + 2NH_4Cl \rightarrow MgCl_2 + 2NH_4OH$

D. $Zn + 2AgCN \rightarrow 2Ag + Zn(CN)_2$

Answer: D

Watch Video Solution

83. Which one of the following is an example of disporoportionation reaction ?

A. $3Cl_2(g) + 6OH^-(aq) \rightarrow ClO_3^-(aq) + 5CI^-(aq) + 3H_2O(1)$

B. $Ag^{2+}(aq) + Ag(s) \rightarrow 2Ag^{-4}(aq)$

C. $Zn(s) + CuSO_4(aq) \rightarrow Cu(s) + ZNSO_4(aq)$

D. $2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$

Answer: A

View Text Solution

LEVEL-II (C.W)

1. The number of significant figures in π are

A. Three

B. Infinite number

C. Zero

D. One

Answer: D

Watch Video Solution

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

A. 3,4 and 5

B. 3,3 and 3

C. 3,3 and 4

D. 3,4 and 4

Answer: B

Watch Video Solution

3. If water sample are taken from sea, rivers or lake, they will be found to contain hydrogen and oxygen in the approximate ratio of $1:8$. This indicates the law of :

A. Multiple proportion

B. Constant Porportions

C. Reciprocal Proportions

D. Conservation of mass

Answer: B

Watch Video Solution

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

A. Constant Proportions

B. Conservation of mass

C. Multiple Proportion

D. Law of Gaseous volume

Answer: C

Watch Video Solution

5. The composition of compound A is 40% X and $60Y$. The composition of compound B is 25% X and $75\% Y$. According to the law of multiple Proportions the ratio of the weight of element Y in compounds A and B is:

A. $1:2$

B. $2:1$

C. $2:3$

D. $3:4$

Answer: A

View Text Solution

6. The density of water is $1gm/ml$. The volume of water drop is 1.8 ml. The no. of molecules present in one water drop are

A. 6.023×10^{23}

B. 6.023×10^{21}

C. 3.011×10^{20}

D. 6.023×10^{22}

Answer: D

Watch Video Solution

7. Increasing order of number of moles of the species (i) 3grams of No (ii) 8.5 grams of PH_3 and (iii) 8 grams of methane is

A. i,ii,iii

B. ii,ii,i

C. i,iii,ii

D. ii,iii,i

Answer: A

Watch Video Solution

8. 0.44 g of colourless oxide of nitrogen occupies 224 ml at STP. The molecular formula is

A. N_2O_5

B. N_2O_3

C. NO_2

D. N_2O

Answer: D

Watch Video Solution

9. How many moles of magnesium phosphate, $Mg_3\left(PO_4\_(2)\right.$ will contain 0.25 mole of oxygen atoms?

A. 3.125×10^{-2}

B. 1.25×10^{-2}

C. 2.5×10^{-2}

D. 0.02

Answer: A

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10. Volume of a gas at STP is 1.12×10^{-7} c c. Calculate the number of molecules in it

A. 6.02×10^{23}

B. 3.01×10^{12}

C. 6.02×10^{12}

D. 3.01×10^{23}

Answer: B

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11. Number of electrons in 1.8 grams of H_2O are

A. 6.02×10^{23}

B. 3.01×10^{23}

C. 0.602×10^{23}

D. 60.22×10^{23}

Answer: A

Watch Video Solution

12. From 320 mg. of O_2, 6.023×10^{20} molecules are removed, the no. of moles remained are

A. 9×10^{-3} moles

B. 9×10^{-2} moles

C. Zero

D. 3×10^{-3} moles

Answer: A

Watch Video Solution

13. An oxide of nitrogen has a molecular weight 92. Find the total number of electrons in one gram mole of that oxide.

A. $4.6N$

B. $46N$

C. $23N$

D. $2.3N$

Answer: B

Watch Video Solution

14. Total number of species present in 1 mole of potash alum in terms of avagadro number, 'N' are

A. 3N

B. 5N

C. 8N

D. 32N

Answer: D

View Text Solution

15. Number of moles of KI required to prepare 0.4 moles of K_2Hgl_4, when $HgCl_2$ reacts with Kl

A. 0.4 moles of KI

B. 0.8 moles of KI

C. 1.6 moles of KI

D. 3.2 moles of KI

Answer: C

Watch Video Solution

16. How many water molecules are there in one drop pf water (volume $0.0018ml$) at room temperature?

A. 6.023×10^{19}

B. 1.084×10^{18}

C. 6.023×10^{23}

D. 4.84×10^{16}

Answer: A

Watch Video Solution

17. 1.5g $CdCl_2$ was formed to contain 0.9g Cd. Calculate the atmic weight of Cd.

A. 118

B. 112

C. 106.5

D. 53.25

Answer: C

Watch Video Solution

18. $2.0g$ of a metallic carbonate on decomposition gave $1.5g$ of metallic oxide. The equivalent mass of metal is

A. 58

B. 29

C. 5.8

D. 2.9

Answer: A

View Text Solution

19. The vapour density of a tribasic acid is x. the equivalent mass of that acid is

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

B. $x - 3$

C. $\frac{2x}{3}$

D. $2x - 3$

Answer: C

Watch Video Solution

20. The equivalent weight of divalent metal is 31.82. The weight of a single atom is

A. $32.55 \times 6.02 \times 10^{23} g$

B. $32.77 \times 6.02 \times 10^{23} g$

C. $63.64 g$

D. $63.64 / 6.02 \times 10^{23} g$

Answer: D

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21. If N_A is Avogadro's number, then the number of oxygen atom in one g-equivalent of oxygen is

A. N_A

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

C. $\frac{N_A}{4}$

D. $2 \times N_A$

Answer: B

Watch Video Solution

22. At STP one litre of a gas weight 1.25 grams. The gas contains $85.71\,\%$ of carbon and $14.29\,\%$ of hydrogen. The formula of the compound is

A. CH_4

B. C_2H_6

C. C_3H_8

D. C_2H_4

Answer: D

Watch Video Solution

23. A certain compound contains magnesium, carbona dn Nitrogen in the mass ratio $12:12:14$. The formula of the compound is

A. $MgCN$

B. Mg_2CN

C. $MgCN_2$

D. $Mg(CN)_2$

Answer: D

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24. An organic compound having molecular mass 60 is found to contain $C = 20\,\%$, $H = 6.67\,\%$, and $N = 46.67\,\%$, while rest is

oxygen. On heating, it gives NH_3 along with a solid residue. The solid residue gives violet color with alkaline copper sulphate solution. The compounds is

A. CH_3NCO

B. CH_3CONH_2

C. $\left(NH_2\right)_2CO$

D. $CH_3CH_2CONH_2$

Answer: C

Watch Video Solution

25. A compound of phosphorous and sulphur contains $1.24gm$ of phosphorous in 2.2 gm of the compound. The formula of the compound is

A. P_4S_3

B. P_3S_4

C. P_3S_2

D. P_2S_3

Answer: A

Watch Video Solution

26. The relative number of atoms of different elements in a compound are as follows : $A = 1.33, B = 1$ and $C = 1.5$. The emperical formula of the compound is

A. $A_2B_2C_3$

B. ABC

C. $A_8B_6C_9$

D. $A_3B_3C_4$

Answer: C

View Text Solution

27. A compound has $40\,\%$ of carbon by weight. If molecular weight of the compound is 90, the number of carbon atoms present in 1 molecule of the compound are

A. 3

B. 2

C. 1

D. 5

Answer: A

Watch Video Solution

28. A compound has 20% of nitrogen by weight. If one molecule of the compound contains two nitrogen atoms, the molecular weight of the compound is

A. 35

B. 70

C. 140

D. 280

Answer: C

Watch Video Solution

29. $3.0gms$ of an organic compound on combustion give $8.8gm$ of CO_2 and $5.4gm$ of water. The empirical formula of the compound is

A. CH_3

B. C_2H_4

C. C_2H_2

D. C_2H_6

Answer: A

Watch Video Solution

30. The oxide of a metal contains $40\,\%$ of oxygen. The valency of metal is 2. what is the atomic weight of the metal ?

A. 12

B. 40

C. 36

D. 24

Answer: D

Watch Video Solution

31. When a sample of Baking soda is strongly ignited in a crucible it suffered a loss in weight of $3.1g$. The mass of baking soda is

A. $16.8g$

B. $8.4g$

C. $11.6g$

D. $4.2g$

Answer: B

View Text Solution

32. 20 ml of a hydro carbon requires 100 ml of oxygeb for complete combustion. In this reaction 60 ml of carbondioxide is produced. The formula of hydro carbon is

A. C_2H_4

B. C_3H_6

C. C_3H_8

D. C_6H_6

Answer: B

View Text Solution

33. $18.4gms$ of a mixture of calcium carbonate and magnesium carbonate on heating gives 4.0 gms of magnesium oxide. The volume of CO_2 produced at STP in this process is

A. 1.12 lit

B. 4.48 lit

C. 2.24 lit

D. 3.36lit

Answer: C

View Text Solution

34. A solution containing 0.2 mole of ferric chloride is allowed to react with 0.24 mole of sodium hydroxide. The correct statement for this reaction is

A. Limiting reagent for this reaction is $NaOH$

B. 0.08 moles of $Fe\left(OH_3\right)$ is formed

C. 0.12 mole of $FeCI_3$ is left unreacted

D. All the above

Answer: B

Watch Video Solution

35. $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l), \Delta H = -890kJ$

what is the calorific or fuel value of $1kg$ of CH_4?

A. 40 ml

B. 20 ml

C. 60ml

D. 30ml

Answer: B

Watch Video Solution

36. What weight of hydrogen at STP couble be contained in a vessel that hold 4.8 g of oxygen at STP

A. 1gm

B. $0.5gm$

C. $0.25gm$

D. $0.125gm$

Answer: B

Watch Video Solution

37. 100 mL of x M $KMnO_4$ is requried oxidise 200 mL of 0.2 M ferric oxalate in acidic medium what is the normality of $KMnO_4$?

A. 0.0075

B. 0.005

C. 0.01

D. 0.015

Answer: A

Watch Video Solution

38. 19g og a mixture containing $NaHCO_3$ and Na_2CO_3 on complete heating liberated $1,12L$ of CO_2 at STP. The weight of the remaining solid was $15.9g$. What is the weight (in g) of Na_2CO_3 in the mixture before heating ?

A. 8.4

B. 15.9

C. 4.0

D. 10.6

Answer: D

Watch Video Solution

39. The number of molecules of CO_2 liberated by the complete combustion of $0.1g$ atoms of graphite in air is

A. 3.01×10^{22}

B. 6.02×10^{23}

C. 6.02×10^{22}

D. 3.01×10^{23}

Answer: C

Watch Video Solution

40. An aqueous solution of $6.3g$ oxalic acid dihydrate is made up to $250mL$. The volume of $0.1NNaOH$ required to completely neutralise $10mL$ of this solution is

A. 40 ml

B. 20 ml

C. 10ml

D. 4 ml

Answer: A

Watch Video Solution

41. The normality of orthophosphoric acid having purity of 70% by weight and specific gravity 1.54 is :

A. $11N$

B. $22N$

C. $33N$

D. $44N$

Answer: C

Watch Video Solution

42. Mole fraction of $C_3H_5(OH)_3$ in a solution of $36g$ of water and $46g$ of glycerine is:

A. 0.46

B. 0.36

C. 0.20

D. 0.40

Answer: C

Watch Video Solution

43. The volume of water to be added to 400 ml of $N/8HCI$ to make it exactly $N/12$ is

A. 400 ml

B. 300ml

C. 200 ml

D. 100 ml

Answer: C

Watch Video Solution

44. When 100 ml of 10M solution of H_2SO_4 and $100ml$ of 1M solution of $NaOH$ are mixed the resulting solution will be

A. Acidic

B. Basic

C. Neutral

D. Can not predicted

Answer: A

Watch Video Solution

45. In order to prepare one litre normal solution of $KMnO_4$, how many grams of $KMnO_4$ are required if the solution is used in acidic medium for oxidation

A. 158

B. 79

C. 31.6

D. 790

Answer: C

Watch Video Solution

46. $12.5mL$ of a solution containing $6.0g$ of a dibasic acid in $1L$ was found to be neutralized by $10mL$ a decinormal solution of $NaOH$. The molecular weight of the acid is

A. 75

B. 110

C. 120

D. 150

Answer: D

Watch Video Solution

47. 50 gm of sample of sodium hydroxide required for complete neutralisation, 1 litre 1 N HCl. What is the percentage purity of $NaOH$ is

A. 50

B. 60

C. 70

D. 80

Answer: D

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48. 40 mg of pure sodium hydroxide is dissolved in 10 L of distilled water. The pH of the solution is

A. 5 gm

B. 2g

C. 12.5g

D. 4 gm

Answer: C

Watch Video Solution

49. 100 ml of 0.3 M HCl is mixed with 200 ml of 0.3 M H_2SO_4. Calculate the final molarity of the H^+ ions in the resulting solution. Fill your answer by multiplying with 10.

A. $0.5M$

B. $0.05M$

C. $0.1M$

D. $0.2M$

Answer: C

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50. The density of $3M$ solution of $NaCl$ is $1.25gmL^{-1}$. The molality of the solution is

A. $2.79m$

B. $1.79m$

C. $3.5m$

D. $5.58m$

Answer: A

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51. The oxidation state of iron in the coordination sphere of prussain blue is

A. $+2$

B. 0

C. $+1$

D. $+3$

Answer: A

Watch Video Solution

52. Oxidation number of carbon in SCN ion is

A. $+2$

B. -2

C. $+4$

D. -4

Answer: C

Watch Video Solution

53. In ICl_3 oxidation numbers of iodine and chlorine are

A. 0 & 0

B. $+3$ & -1

C. -1 & $+3$

D. -3 & $+1$

Answer: B

Watch Video Solution

54. Lead Nitrate is strongly heated. In this reaction the oxidation numbers of following atoms change

A. Only in Pb and N

B. Only in N and O

C. Pb, N and O

D. Only in N

Answer: B

Watch Video Solution

55. The sum of the oxidation number of the carbon atoms in CH_3CHO is

A. -2

B. $+2$

C. -4

D. -1

Answer: A

Watch Video Solution

56. In the reaction between ethylene and alkaline $KMnO_4$ the oxidation number of Manganese is

A. Decreases from $+7$ to $+2$

B. Decreases from $+7$ to $+6$

C. Decreases from $+7$ to $+4$

D. Increases from $+4$ to $+7$

Answer: C

Watch Video Solution

57. One gas bleaches the colour of flowers by reduction and other by oxidation. These gases are

A. CO & CI_2

B. H_2S & Br_2

C. SO_2 & CI_2

D. NH_4 & SO_3

Answer: C

Watch Video Solution

58. (A) The reaction of oxalic acid with acidified $KMnO_4$ is first slow and then proceeds with faster speed. (R) Acidified $KMnO_4$ is a strong oxidising agents.

A. K^+

B. MnO_4^-

C. $C_2O_4^{2-}$

D. CO_2

Answer: B

Watch Video Solution

59. Which of the following has//have been arranged in order of decreasing oxidation number of sulphur?

A. $H_2S_2O_7 > Na_2S_4O_6 > Na_2S_2O_3 > S_8$

B. $SO^{2+} > SO_4^{2-} > SO_3^{2-} > HSO_4^-$

C. $H_2S > SCl_2 > H_2SO_3 > H_2SO_5$

D. $H_2SO_4 > SO_2 > H_2S > H_2S_2O_8$

Answer: A

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60. $3HOCl \rightarrow 2HCl + HClO_3$ is an example of

A. Disproportionation reaction

B. Displacement reaction

C. Chemical combination reaction

D. Decomposition reaction

Answer: A

Watch Video Solution

61. The oxidation state of the most electronegative atom in each of the product is

$H_2 + O_2 \rightarrow H_2O_2 + H_2O$

A. $-2, \ -2$

B. $+1, \ -2$

C. $+2, \ -1$

D. $-1, \ -2$

Answer: D

Watch Video Solution

62. Which of the following reactions involves neither oxidation nor reduction ?

A. $CrO_4^{-2} \rightarrow Cr_2O_7^{2-}$

B. $Cr \rightarrow CrCl_3$

C. $Na \rightarrow Na^+$

D. $2S_2O_3^{2-} \rightarrow S_4O_6^{2-}$

Answer: A

Watch Video Solution

63. In the chemical reaction,

$$K_2Cr_2O_7 + xH_2SO_4 + ySO_2 \rightarrow K_2SO_4 + Cr_2\left(SO_4\right)_3 + zH_2O$$

$x, y,$ and z are

A. 1,3,1

B. 4,1,4

C. 3,2,3

D. 2,1,2

Answer: A

Watch Video Solution

64. The reaction

$$5H_2O_2 + XClO_2 + 2OH^- \rightarrow XCl^- + YO_2 + 6H_2O$$

is balanced if

A. $x = 5, y = 2$

B. $x = 2, y = 5$

C. $x = 4, y = 10$

D. $x = 5, y = 5$

Answer: B

Watch Video Solution

65. In the balanced chemical reaction

$$IO_3^{\ominus} + al^{\ominus} + bH^{\ominus} \rightarrow cH_2O + dI_2$$

a, b, c, and d, respectively, correspond to

A. 5,6,3,3

B. 5,3,6,3

C. 3,5,3,6

D. 5,6,5,5

Answer: A

Watch Video Solution

LEVEL -III

1. A gaseous mixture contains oxygen and nitrogen in the ratio of $1:4$ by weight therefore the ratio of their number of molecules is

A. $1:8$

B. $3:16$

C. $1:4$

D. $7:32$

Answer: D

Watch Video Solution

2. Versene, a chelating agent having chemical formula $C_2H_4N_2\left(C_2H_4O_2Na\right)_4$. If each mole of this compound could

bind 1 mole fo Ca^{2+}, then the rating of pure versene expressed as mg of $CaCO_3$ bound per g of chelating agent is

A. 100 mg

B. 163 mg

C. 200 mg

D. 263 mg

Answer: D

Watch Video Solution

3. One mole of a mixture of CO and CO_2 requires exactly 20g of NaOH in solution for complete conversion of all the CO_2 into Na_2CO_3 if the mixture (one mole is completely oxidised to CO_2

A. 60g

B. 80g

C. 40g

D. 20g

Answer: B

Watch Video Solution

4. 1.23 g of Nitro Benzene on reduction with $Zn + NH_4Cl$ then its gives N-Phenyl hydroxyl amine that isomerised to 4-amino phenol. Then no. of electron involved and the element reduced is

A. $24 \times 10^{21}, N$

B. $24 \times 10^{24}, N$

C. $12 \times 10^{23}, N$

D. $6 \times 10^{23}, N$

Answer: A

Watch Video Solution

5. A mixture of $HCOOH$ and $H_2C_2O_4$ is heated with conc. H_2SO_4. The gas produced is collected and on treating with KOH solution the volume of the gas decreases by $1/6th$. Calculate molar ratio of two acids in original mixure.

A. $4:1$

B. $1:4$

C. $3:1$

D. $2:1$

Answer: A

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6. When burnt in air, a 12.0 g mixture of carbon and sulphur yields a mixture of CO_2 and SO_2 , in which the number of moles of SO_2 is half that of CO_2.The mass of the carbon the mixture contains is : (At . Wt. S=32)

A. 0.75

B. 0.5

C. 0.4

D. 0.25

Answer: B

Watch Video Solution

7. The oxide of a metal contains $40\ \%$ of oxygen. The valency of metal is 2. what is the atomic weight of the metal ?

A. ≈ 87

B. ≈ 70

C. ≈ 77

D. ≈ 93

Answer: A

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8. Cuprous sulphide and silver sulphide are isomorphous. The atomic mass of Cu is 63.57 g/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. 208

B. 108

C. 112

D. 115

Answer: B

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9. A sample of 1.0g of solid $Fe_2O_3 of 80\ \%$ purity is dissolved in a moderately concentrated HCl solution which is reduced by zinc dust. The resulting solution required 16.7mL of a 0.1M solution

of the oxidant. Calculate the number of electrons taken up by the oxidant.

A. 5

B. 2

C. 4

D. 6

Answer: D

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10. A gaseous hydrocarbon gives upon combustion $0.72g$ of water and $3.08g$ of CO_2. The empirical formula of the hydrocarbon is

A. C_3H_4

B. C_6H_5

C. C_7H_8

D. C_2H_4

Answer: C

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11. 10 " mL of " a gaseous organic compound containing C, H and O only was mixed with 100 " mL of " O_2 and exploded under condition which allowed the H_2O formed to condense. The volume of the gas after explosion was 90 mL. On treatment with KOH solution, a further contraction of 20 mL in volume was observed. The vapour density of the compound is 23. All volume measurements were made under the same condition.

Q.The molecular formula of the compound is

A. C_3H_6O

B. C_2H_4O

C. C_2H_6O

D. C_3H_8O

Answer: C

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12. A hydrocarbon contains $10.5g$ of carbon per gram of hydrogen. $1L$ of vapour of the hydrocarbon at $127^\circ C$ and 1 atm pressure weighs $2.8g$. Find the molecular formula of the hydrocarbon.

A. C_7H_8

B. C_6H_{10}

C. C_7H_6

D. C_6H_{12}

Answer: A

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13. When $K_2Cr_2O_7$ is heated with conc. H_2SO_4 and soluble chloride such as KCl :

A. 49.4

B. 29.4

C. 39.4

D. 59.4

Answer: C

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14. A 20 mL mixture of CO, CH_4, and Helium (He) gases is exploded by an electric discharge at room temperature with excess of oxygen. The volume contraction is found to be 13 mL. A further contraction of 14 mL occurs when the residual gas is treated wityh KOH solution. Find out the composition of the gaseous mixture in terms of volume percentage.

A. CO - 40 % , CH_4 - 20 % , He - 40 %

B. CO - 40 % , CH_4 - 30 % , He - 20 %

C. CO - 50 % , CH_4 - 20 % , He - 30 %

D. CO - 50 % , CH_4 - 10 % , He - 40 %

Answer: C

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15. $7.36g$ of a mixture of KCI and KI was dissolved in H_2O to prepare 1 litre solution 25 ml of this required $8.45ml$ of $0.2NAgNO_3$, what is % of KI in mixture ?

A. 57.28

B. 47.28

C. 5.72

D. 149.12

Answer: A

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16. Equal weights of Zn metal and iodine are mixed together and I_1 is completley converted to ZnI_2. What fractionn by weight of original Zn remains unreacted? (Zn=65,I=127)

A. 0.6

B. 0.74

C. 0.47

D. 0.17

Answer: B

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17. A hydrocarbon 'X' have $81\,\%$ of carbon. Volume of CO_2 liberated at 298K and 76 cm of Hg when $0.55gm$ of 'x' undergoes

combustion

A. $0.90l$

B. $11.09l$

C. $1.89l$

D. $1.09l$

Answer: A

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18. Gastric juice contains 3g HCl per liter. If a person produces 2.5 L of gastric juice per day, how many antacid tables each containing 400 mg of $Al(OH)_3$ are needed to neutralize all the HCl produced in one day ?

A. 18

B. ≈ 13

C. 20

D. 17

Answer: B

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19. 50.0 kg of $N_2(g)$ and 10.0 kg of $H_2(g)$ are mixed to produce $NH_3(g)$. Calculate the $NH_3(g)$ formed. Identify the limiting reagent in the production of NH_3 in this situation.

A. H_2, $56.67kg$

B. H_2, $13.1kg$

C. H_2, $1.56kg$

D. H_2, $36.2kg$

Answer: A

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20. Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 according to the reaction:

$$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$$

What mass of $CaCO_3$ is required to react completely with $25mL$ of $0.75MHCl$?

A. $1.825g$

B. $0.9375g$

C. $1.8357g$

D. $0.4625g$

Answer: B

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21. $3.92g$ of ferrous ammonium sulphate (FAS) react completely with $50mlN/10KMnO_4$ solution. The percentage purity of the sample is

A. 50

B. 78.4

C. 80

D. 28

Answer: A

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22. Upon heating 1 L of 2 N HCl solution, 36.5 g of HCl is lost and the volume of solution resuces to 800 mL. Calculate . (a). The normality of the resultant solution.

(b). The number of equivalents of HCl in 100 mL of the original solution..

A. $18.25N$

B. $1.138N$

C. $0.569N$

D. $0.5N$

Answer: C

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23. Metal X forms wo oxides. Formula of the first oxide is XO_2. The first oxide contains $50\,\%$ of oxygen. If the second oxide contains $60\,\%$ of oxygen, the formula of the second oxide is

A. X_2O

B. XO_3

C. X_2O_3

D. X_3O_2

Answer: B

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24. 0.2 moles of a hydro carbon, which cannot decolourise bromine water, on complete combustion produced $26.4gm$ of

CO_2. The molecular weight of the hydro carbon is

A. 44

B. 42

C. 40

D. 58

Answer: A

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25. A sample of urine containing $0.3g$ of urea was treated with an excess of $0.2M$ nitrous acid, according to the equation.

$$NH_2CONH_2 + 2HNO_2 \rightarrow CO_2 + 2N_2 + 2H_2O$$

The gass produced passed through aqueous KOH solution and the final valume is measured.

(Given, $Mw_{\text{urea}} = 60 gmol^{-1}$, molar volume of gas at standard condition, i.e., at room temperature $25^{\circ}C$ and 1 atm pressure. RTP (room temperature pressure) also is $24.4L$ or $24400 mLmol^{-1}$)

What is the volume of HNO_2 consumed by urea?

A. 89.6c c

B. 179.2cc

C. 44.8cc

D. 22.4cc

Answer: A

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26. 50 vol of a gas X is mixed with 70 vol of oxygen. After explosion the gas is passed through KOH, 45 vol. of oxygen is left. What is the gas X?

A. CO_2

B. O_2

C. CO

D. N_2

Answer: C

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27. A certain sample of coal contains $1\ \%$ of sulphur by weight. What is the weight of sulphur dioxide produced when $2' 10^6$ kg

of this coal is burnt?

A. $2 \times 10^4 kg$

B. $4 \times 10^4 kg$

C. $4 \times 10^5 kg$

D. $2 \times 10^5 kg$

Answer: B

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28. 5g of crystalline salt rendered anhydrous lost 1.89g of water. The formula weight of the anhydrous salts is 160. The number os water molecules of crystallisation is

A. 1

B. 2

C. 3

D. 5

Answer: D

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29. ng of substance X reacts with mg of substance Y to from pg of substance R and p g of substance S. This reaction can be represented as, $X + Y = R + S$. The relation which can be established in the amounts of the reactants and the products will be

A. $n - m = p - q$

B. $n + m = p + q$

C. $n = m$

D. $p = q$

Answer: B

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30. To neutralize completely $20mL$ of $0.1M$ aqueous solution of phosphorus $\left(H_3PO_3\right)$ acid the volume of $0.1M$ aqueous KOH solution required is:

A. 40 ml

B. 20ml

C. 10ml

D. 60ml

Answer: A

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31. Density of $2.05M$ solution of acetic acid in water is $1.02g/mL$.

The molality of same solution is:

A. $1.14mol/kg$

B. $3.28mol/kg$

C. $2.28mol/kg$

D. $0.44mol/kg$

Answer: C

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32. The density $\left(\text{in} gmL^{-1}\right)$ of a $3.60M$ sulphuric acid solution that is $29\ \%\ H_2SO_4$ (Molar mass $= 98 gmol^{-1}$) by mass will be:

A. 1.45

B. 1.64

C. 1.88

D. 1.22

Answer: D

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33. 0.1N solution of a dibasic acid can be prepared by dissolving $0.45gm$ of the acid in water and diluting to 100ml. The molecular mass of the acid is

A. 45

B. 90

C. 135

D. 180

Answer: B

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34. 100ml of $0.2NHCl$ solution is added to 100ml of $0.2NAgNO_3$ solution. The molarity of nitrate ions in the resulting mixture will be

A. $0.5M$

B. $0.05M$

C. $0.1M$

D. $0.2M$

Answer: C

Watch Video Solution

35. The density of $3M$ solution of $NaCl$ is $1.25 gmL^{-1}$. The molality of the solution is

A. $2.79m$

B. $1.79m$

C. $3.5m$

D. $5.58m$

Answer: A

Watch Video Solution

36. 0.16 g of dibasic acid required 25 ml of decinormal NaOH solution for complete neutralisation. The molecular weight of the acid will be

A. 32

B. 64

C. 128

D. 256

Answer: C

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37. What will be the normally of a solution obtained by mixiing 0.45N and 0.60N NaOH in the ration 2:1 by volume?

A. $0.5g$

B. $25g$

C. 20g

D. 5g

Answer: C

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38. $5.3g$ of Na_2CO_3 taken in a 250 ml flask and water added upto the mark. 10 ml of that solution was taken in a 50 ml flask

water added upto the mark. Find molarity of that dilute solution.

A. 0.1M

B. 0.02M

C. 0.04M

D. None

Answer: C

Watch Video Solution

39. 0.5 gmixture of $K_2Cr_2O_7$ and $KMnO_4$ was treated with excess of KI in acidic medium. Iodine liberated required $150cm^3$ of 0.10 N solution of thiosulphate solution for titration.

Find trhe percentage of $K_2Cr_2O_7$ in the mixture :

A. 14.64

B. 34.2

C. 65.69

D. 50

Answer: A

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40. Find out % of oxalate ion ina given sample of an alkali metal oxalate salt, 0.30g of it is dissolve in 100mL water and its required 90mL OF Centimolar $KMnO_4$ solution in aicdic medium:

A. 66 %

B. 55 %

C. 44 %

D. 6.6 %

Answer: A

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41. The molarity of a solution obtained by mixing 750 mL of 0.5 M HCl with 250 mL of 2 M HCl will be

A. $1.00M$

B. $1.75M$

C. $0.975M$

D. $0.875M$

Answer: D

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

A. $0.50M$

B. $1.78M$

C. $1.02M$

D. $2.05M$

Answer: D

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43. A 5.2 molal aqueous of methyl alcohol, CH_3OH, is supplied. What is the molefraction of methyl alcohol in the solution ?

A. 0.190

B. 0.086

C. 0.050

D. 0.100

Answer: B

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44. One mole of N_2H_4 loses ten moles of electrons to form a new compound A. Assuming that all the nitrogen appears in

the new compound, what is the oxidation state of nitrogen in A ? (There is no change in the oxidation state of hydrogen.)

A. $+1$

B. $+2$

C. $+3$

D. $+5$

Answer: C

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45. What is the oxidation state of Fe in the product formed when acidified Potasssium ferrocyanide $\left(K_4\left[Fe(CN)_6\right]\right)$ is treated with hydrogen peroxide?

A. $+2$

B. $+3$

C. $+1$

D. $+6$

Answer: B

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46. In the reaction, $A^{n+} + MnO_4^- \rightarrow A^5 + Mn^{2+}$ if 00.05 mole of A^{n+} is oxidized by 0.02 mole of MnO_4^-, the value of 'n' is

A. 1

B. 2

C. 3

D. 4

Answer: C

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47. Which of the following sequence is correct with reference to the oxidation number of iodine?

A. $I_2 < ICl < HI < HIO_4$

B. $HIO_4 < ICl < I_2 < HI$

C. $I_2 < HI < ICl < HIO_4$

D. $HI < I_2 < ICl < HIO_4$

Answer: D

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48. When $KMnO_4$ acts as an oxidising agnet and ultimetely from MnO_4^{2-}, MnO_2, Mn_2O_3, and Mn^{2+}, then the number of electrons transferred in each case, respectively, are

A. 4,3,1,5

B. 1,5,3,7

C. 1,3,5,4

D. 3,5,7,1

Answer: C

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49. In Balancing the reaction

$XZn + NO_3^- + YH^+ \rightarrow XZn^{2+} + NH_4^+ + ZH_2O$, XY & Z are

A. 4,10,3

B. 3,8,3

C. 3,10,3

D. 4,3,10

Answer: A

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50. For the redox reation

$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} CO_2 + H_2O$

The correct stoichiometric coefficients of Mno_4^-, $C_2O_4^{2-}$ and H^+ respectively:

A. 2,5,16

B. 16,5,2

C. 5,16,2

D. 2,16,5

Answer: A

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51. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requres x mole of $KMnO_4$ in acidic medium for complete oxidation. X is:

A. 0.5 mole

B. 0.9 mole

C. 1.2 mole

D. 4.5 mole

Answer: B

Watch Video Solution

LEVEL -IV

1. Two students performed the same experiment separately and each one of them recovered two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct optioin out of the following statements.

Student	Readings	
	(I)	(II)
A	3.01	2.99
B	3.05	2.95

A. Results of both the students are neither accurate nor precise

B. Results of student A are both precise and accurate

C. Results of student B are neither precise nor accurate

D. Results of student B are both precise and accurte

Answer: B

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2. A measured temperature on Fahrenheit scale is $200\ ^\circ F$. What will this reading be on clesius scale?

A. $40\ ^\circ C$

B. $94\ ^\circ C$

C. $93.3\ ^\circ C$

D. $30\ ^\circ C$

Answer: C

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3. If 500mL of a 5M solution is diluted to 1500 mL, what will be the molarity of the solution obtained?

A. 1.5M

B. 1.66M

C. 0.017M

D. 1.59M

Answer: B

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4. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atom?

A. 4g He

B. 46g Na

C. 0.40 g Ca

D. 12 g He

Answer: D

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5. If the concentration of glucose $\left(C_6H_{12}O_6\right)$ in blood is 0.9 g L^{-1}, what will be the molarity of glucose in blood?

A. $5M$

B. $50M$

C. $0.005M$

D. $0.5M$

Answer: C

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6. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water?

A. 0.1m

B. 1M

C. 0.5m

D. 1m

Answer: D

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7. One mole of any substance contains 6.022×10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in 100mL of 0.02M H_2SO_4 solution is

A. 12.044×10^{20} molecules

B. 6.022×10^{23} molecules

C. 1×10^{23} molecules

D. 12.044×10^{23} molecules

Answer: A

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8. What is the mass per cent of carbon in carbon dioxide?

A. 0.034 %

B. 27.27 %

C. 3.4 %

D. 28.7 %

Answer: B

Watch Video Solution

9. The empirical formula and molecule mass of a compound are CH_2O and 180g respectivel. What will be the molecular formula of the compound?

A. $C_9H_{18}O_9$

B. CH_2O

C. $C_6H_{12}O_6$

D. $C_2H_4O_2$

Answer: C

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10. If the density of a solu tion is 3.12 g mL^{-1}, the mass of 1.5mL solution in significant figures is.....

A. $4.7g$

B. $4680 \times 10^{-3}g$

C. $4.680g$

D. $46.80g$

Answer: A

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11. Which of the following statements about a compound is incorrect?

A. A molecule of a compound has atoms of different elements

B. A compound cannot be separated into its constituent elements by physical methods of separation

C. A compound retains the physical properties of its constituent is fixed

D. The ratio of atom of different elements in a compound is fixed

Answer: C

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12. Which of the following statements is correct about the reaction given below:-

$4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(g)$

A. Total mass of irona and oxygen in reactants =total mass of iron and oxygen in product therefore it follows law of conservation of mass

B. Total mass of reactants =total mass of produced: therefore, law of multiple proportions is followed.

C. Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess.

D. Amount of Fe_2O_3 produced will decrease if the amount of any one of the reactants (iron or oxygen) is taken in excess.

Answer: A

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13. Which of the following reactions isnot correct according to the law of conservation of mass?

A. $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$

B. $C_3H_8(g) + O_2 \rightarrow CO_2(g) + H_2O(g)$

C. $P_4(s) + 5O_2(g) \rightarrow P_4O_{10}(s)$

D. $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$

Answer: B

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14. Which of the following statements indicates that law of multiple proportion is being followed?

A. Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1:2

B. Carbon forms two oxides namely CO_2 and CO where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2:1

C. When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed

D. At constant temperature and pressure 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour.

Answer: B

 Watch Video Solution

15. One mole of oxygen gas at STP is equal to .....

A. 6.022×10^{22} molecules of oxygen

B. 6.022×10^{23} atoms of oxygen

C. 16g of oxygn

D. 32 g of oxygen

Answer: D

Watch Video Solution

16. Sulphuric acid reacts with sodium hydroxide as follows

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

when 1L of 0.1M sulphuric acid solution is allowed to react with

1L of 0.1M sodium hydroxide solution, the amount of sodium solphate formed and its molarity in the solution obtained is

A. $0.1 molL^{-1}$

B. $7.10g, 0.025 molL^{-1}$

C. $0.025M$

D. $3.55g$

Answer: B

Watch Video Solution

17. Which of the following pairs have the same number of atoms?

A. 16g of $O_2(g)$ and 4g of $H_2(g)$

B. 16g of O_2 and 44g of CO_2

C. 28g of N_2 and 32g of O_2

D. 24g of $C(s)$ and 23g of $Na(s)$

Answer: C

Watch Video Solution

18. Which of the following solutions have the same concentration?

A. 20g of $NaOH$ in 200mL of solution

B. 0.5 mol of $NaCI$ in $200mL$ of solution

C. 40g of $NaOH$ in $100mL$ of solution

D. 20g of KOH is $200mL$ of solution

Answer: A

Watch Video Solution

19. Which of the following terms are unitless?

A. Molality

B. Molarity

C. Mole fraction & Mass percent

D. Normality

Answer: C

Watch Video Solution

20. What will be the mass of one $.^{12}C$ atom in g?

A. $1.5 \times 10^{-20} g$

B. $1.99 \times 10^{-23} g$

C. $2.5 \times 10^{-23} g$

D. $1.99 \times 10^{-20} g$

Answer: B

Watch Video Solution

21. Calculate the mass per cent of calcium, phosphorus and oxygen in calcium phosphate $Ca_3\left(PO_4\right)_2$.

A. 38.71 %

B. 20 %

C. 41.29 %

D. 27.27 %

Answer: C

Watch Video Solution

22. 45.4L of dinitrogen reacted with 22.7L of dioxygen and 45.4 L of nitrous oxide was formed the reaction is given below

$2N_2(g) + O_2(g) \rightarrow 2N_2O(g)$

Which law is being obeyed in this experiment? Write the statement of the law?

A. Gay-Lyssac low of gaseous volumes

B. Law of definite proportions

C. Law of multiple propertion

D. Law of concervation of mass

Answer: A

Watch Video Solution

23. Calculate the average atomic mass of hydrogen using the following data

Isotope % Natural abundance Molar mass

$._1^1H99.9851$

$._1^2H0.0152$

A. 1

B. 1.00015

C. 2

D. 1.5

Answer: B

Watch Video Solution

24. Hydrogen gas is prepared in the laboratory by reacting dilute HCl with granulated zinc, Following reaction takes place

$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

Calculate the voluem of hydrogen gas liberated at STP when 32.65 g of zinc reacts with HCl. 1 mol of a gas occupies 22.7 L volume at STP, atomic mass of Zn=65 .3u

A. $11.35L$

B. $22.7L$

C. $16.42L$

D. $11L$

Answer: A

Watch Video Solution

25. The density of 3 molal solution of NaOH is 1.110g mL^{-1}. Calculate the molarity of the solution.

A. 2M

B. 3.5M

C. 1.5M

D. 3M

Answer: D

Watch Video Solution

26. If 4 g of NaOH dissovles in 36g of H_2O, calculate the mole fraction of each component in the solution. (specific gravity of solution is $1gmL^{-1}$).

A. 2.5M

B. 3M

C. 2M

D. 1.5M

Answer: A

Watch Video Solution

27. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction $2A + 4B \rightarrow 3C + 4D$,

when 5 moles of A react with 6 moles of B, then

(a) which is the limiting reagent?

(b) calculate the amount of C formed?

A. A, 2.5 moles of C

B. B, 4.5 moles of C

C. C, 4 moles of C

D. D, 3.5 moles of C

Answer: B

Watch Video Solution

28. Match the following

(i)	88 g of CO_2	(a)	0.25 mol
(ii)	6.022×10^{23} molecules of H_2O	(b)	2 mol
(iii)	5.6 litres of O_2 at STP	(c)	1 mol
(iv)	96 g of O_2	(d)	6.022×10^{23}molecules
(v)	1 mole of any gas	(e)	3 mol

A. i-a,ii-b,iii-d,iv-c,v-e

B. i-b,ii-c,iii-a,iv-e,v-d

C. i-c,ii-b,iii-d,iv-d,v-e

D. i-d,ii-e,iii-a,iv-b,v-b

Answer: B

Watch Video Solution

29. Assertion(A) The empirical mass of ethene is half of its molecular mass.

Reason(R) The empirical formula represents the simplest whole number ratio of various atoms present in a compound.

A. i

B. ii

C. iii

D. iv

Answer: A

Watch Video Solution

30. Assertion(A) One atomic mass unit is defined as one twelth of the mass of one carbon-12 atom.

Reason(R) Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

A. i

B. ii

C. iii

D. iv

Answer: B

Watch Video Solution

31. Assertion(A) Significant figures for 0.200 is 3 where as for 200 it is 1.

Reason(R) Zero at the end or right of a number are significatn provided they are not on the right side of the decimal point.

A. i

B. ii

C. iii

D. iv

Answer: C

Watch Video Solution

32. Assertion(A) Combustion of 16g of methane give18 g of water.

Reason(R) in the combustion of methane, water is one of the products.

A. i

B. ii

C. iii

D. iv

Answer: C

Watch Video Solution

LEVEL -I (H.W)

1. The correctly reported answer of the addition of 154.21, 6.142 and 23 will be

A. 183.3522

B. 183.35

C. 183.4

D. 183

Answer: D

Watch Video Solution

2. Area of nuclear cross-section is measured in 'Barn'. It is equal to

A. $10^{-20}m^2$

B. $10^{-30}m^2$

C. $10^{-28}m^2$

D. $10^{-14}m^2$

Answer: C

Watch Video Solution

3. The value of Planck's constant is $6.62618 \times 10^{-34}Js$. The number of significant figures in it is

A. 6

B. 5

C. 3

D. 34

Answer: A

Watch Video Solution

4. The number of significant figures in 0.0045 are

A. 2

B. 3

C. 4

D. 5

Answer: A

Watch Video Solution

5. The actual product of 4.327 and 2.8 is 12.1156. The correctly reported answer will be

A. 12

B. 12.1

C. 12.12

D. 12.116

Answer: A

Watch Video Solution

6. On diving 0.46 by 15.374, the atual answer is 0.029236. The correctly reported answer will be

A. 0.02

B. 0.029

C. 0.0292

D. 0.02924

Answer: B

Watch Video Solution

7. Among the following pairs of compounds, the one that illustrates the law of multiple proportions is

A. Na_2O, K_2O

B. CaO, MgO

C. Al_2, O_3, Cr_2O_3

D. CO, CO_2

Answer: D

Watch Video Solution

8. Ferric sulphate on heating gives

A. $2:3$

B. $1:3$

C. $3:1$

D. $3:2$

Answer: D

Watch Video Solution

9. The % composition of four hydro carbons is as follows:

(i)	(ii)	(iii)	(iv)	
75	80	85.7	91.3	$\% C$
2520	14.3	8.7		$\% H$

The date illustrates the law of

A. Constant proportion

B. Conservation of mass

C. Multiple Proprotion

D. Reciprocal Proportions

Answer: C

View Text Solution

10. Among the following pairs of compounds, the one that illustrates the law of multiple proportions is

A. NH_3 & NCl_3

B. H_2S & SO_2

C. CuO & Cu_2O

D. CS_2 & $FeSO_4$

Answer: C

Watch Video Solution

11. In compound A, $1.00g$ nitrogen units with $0.57g$ oxygen. In compound B, $2.00g$ nitrogen combines with $2.24g$ oxygen. In compound C, $3.00g$ nitrogen combines with $5.11g$ oxygen. These results obey the following law

A. Law of constant proportion

B. Law of multiple proportion

C. Law of reciprocal proportion

D. Dalton's law of partial pressure

Answer: B

Watch Video Solution

12. Carbon and oxygen combine to from two oxdies, carbon is respectively $12:16$ and $12:32$. These figurs illustrate the :

A. Law of multiple proportions

B. Law of reciprocal proportions

C. Law of conservation of mass

D. Law of constant proportions

Answer: A

Watch Video Solution

13. A sample of pure carbon dioxide, irrespective of its source contains 27.27% carbon and 72.73% oxygen. The data support

A. Law of conservation of mass

B. Law of definite proportions

C. Law of reciprocal proportions

D. Law of multiple proportion s

Answer: B

Watch Video Solution

14. Atomic weight of Ne is $20.2Ne$ is a mixuture of Ne^{20} and Ne^{22}. Relative abunduance fo heavior isotope is :

A. $1:9$

B. $9:1$

C. $70\ \%$

D. $80\ \%$

Answer: B

Watch Video Solution

15. The vapour density of ethyl alcohol vapour is

A. 46

B. 23

C. 92

D. 69

Answer: B

Watch Video Solution

16. Maximum number of atoms are present in

A. 14 gms of carbon monoxide

B. 2 gm of hydrogen

C. 11.2 lit of nitrogen at STP

D. 1.5 gm atoms of helium

Answer: B

Watch Video Solution

17. The number of atoms in 0.004g of magnesium will be

A. 4×10^{20}

B. 8×10^{20}

C. 10^{20}

D. 6.02×10^{20}

Answer: C

Watch Video Solution

18. Number of atoms in $558.5\ g\ Fe(at.\ wt.55.85)$ is:

A. Twice that 60 g carbon

B. 6.023×10^{22}

C. Half that in 8g He

D. $558.5 \times 6.023 \times 10^{23}$

Answer: C

Watch Video Solution

19. If N_A is Avogadro's number, then number of valence electrons in 4.2 g of nitride ions N^{3-} is

A. $1.4N_0$

B. $2.4N_0$

C. $3.2N_0$

D. $4.2N_0$

Answer: B

Watch Video Solution

20. The weight of 1×10^{22} molecules of $CuSO_4.5H_2O$ is

A. $4.144g$

B. $4.5g$

C. $24.95g$

D. $41.45g$

Answer: A

Watch Video Solution

21. 8gms of O_2 has the same number of molecules as

A. 7gm CO

B. 14gm of CO_2

C. 32 gm of CO_2

D. 44 gms of CO_2

Answer: A

Watch Video Solution

22. Which one of the following gases contain the least number of molecukes ? (At Wt of $P = 32, Cl = 35.5, N = 14, O = 16, C = 12, H = 1$).

A. 4.0g of laughing gas

B. 3.0g of Phosphine

C. 2.0 g of marsh gas

D. 10.0 g of Phosgene

Answer: B

Watch Video Solution

23. The number of molecules present in 4.4g of CO_2 gas is

A. 6.023×10^{23}

B. 5.023×10^{23}

C. 6.023×10^{24}

D. 6.023×10^{22}

Answer: D

Watch Video Solution

24. Calculate the number of Cl^- and Ca^{2+} ions in $222g$ anhydrous $CaCl_2$.

A. $4N, 2N$

B. $2N, 4N$

C. $1N, 2N$

D. $2N.1N$

Answer: A

Watch Video Solution

25. One mole of CO_2 contains

A. 3 gram atoms of CO_2

B. CO_2 molecules

C. $6 \times 10^{23'} O'$ atoms

D. $6 \times 10^{23'} C'$ atoms

Answer: D

Watch Video Solution

26. Maximum number of electrons are present in

A. 2.24 lit. of SO_2 at $S.T.P$

B. 0.2 moles of NH_3

C. 1.5 gm moles of oxygen

D. 2 mole atoms of sulphur

Answer: D

View Text Solution

27. When equal masses of methane and sulphur dioxide are taken, then the ratio of their molecule is

A. $1:1$

B. $1:2$

C. $2:1$

D. $4:1$

Answer: D

Watch Video Solution

28. Molecular weight of a gas is 44. The volume occupied by 2.2 grams of the gas under STP is

A. 1.12 lit

B. 1.14 lit

C. 2.24 lit

D. 5.6 lit

Answer: A

View Text Solution

29. The number of moles of H_2 in 0.224 L of hydrogen gas a STP (273 K, 1 atm) assuming ideal gas behaviour is

A. 1

B. 0.1

C. 0.01

D. 0.001

Answer: C

Watch Video Solution

30. Atomic weight of elements is 40 and its valency is 2. what is its equivalent weigt

A. 20

B. 40

C. 80

D. 10

Answer: A

Watch Video Solution

31. Which of the following has equivalent weight is equal to $\frac{\text{Molecular weight}}{2}$

A. H_2SO_4

B. HCl

C. HNO_3

D. $NaOH$

Answer: A

Watch Video Solution

32. Equivalent weight of Pyrophosphoric acid is $\left(H_4P_2O_7\right)$

A. $M.\ W/1$

B. $M.\ W/2$

C. $M.\ W/4$

D. $M.\ W/3$

Answer: C

View Text Solution

33. Equivalent weight of metal is 20. if the metal forms tripositive ion, its atomic weigth will be

A. 20

B. 40

C. 60

D. 80

Answer: C

Watch Video Solution

34. A compound has 40% of carbon by weight. If molecular weight of the compound is 90, the number of carbon atoms present in 1 molecule of the compound are

A. 3

B. 2

C. 1

D. 5

Answer: A

Watch Video Solution

35. A Gasaeous compound of Nitrogen and Hydrogen contains $12.5\,\%$ by weight of Hydrogen. The density of the compound relative to Hydrogen is 16, the molecular formula of the compound is

A. NH_2

B. NH_3

C. NH_4

D. N_2H_4

Answer: D

View Text Solution

36. An organic compound contains $C = 40\,\%$, $H = 13.33\,\%$, and $N = 46.67\,\%$. Its empirical formula will be

A. $C_3H_{13}N_3$

B. CH_2N

C. CH_4N

D. CH_6N

Answer: C

Watch Video Solution

37. What is the percentage of deterium to heavy water ?

A. 80 %

B. 60 %

C. 40 %

D. 20 %

Answer: D

Watch Video Solution

38. $27g$ of Al will react completely with..... g of O_2

A. 8gm

B. 16gm

C. 32m

D. 24gm

Answer: D

Watch Video Solution

39. 20 gms of sulphur on burning in air produced 11.2 lits of SO_2 at STP. The percentage of unreacted sulphur

A. 80 %

B. 20 %

C. 60 %

D. 40 %

Answer: B

Watch Video Solution

40. The number of moles of Fe_2O_3 formed when 0.5 moles of O_2 and 0.5 moles of Fe are allowed to react are

A. 0.25

B. 0.5

C. 1/3

D. 0.125

Answer: A

Watch Video Solution

41. What is the volume (in lit) of carbon dioxide liberated at STP, when 2.12 grams of sodium carbonate (mol. wt = 106) is treated with excess dilute HCl?

A. 2.28

B. 0.448

C. 44.8

D. 22.4

Answer: B

View Text Solution

42. The amount of zinc required to produce 224 ml of H_2 at NTP on treatement with dilute H_2SO_4 solution will be

A. $0.65g$

B. $0.065g$

C. $65g$

D. $6.5g$

Answer: A

View Text Solution

43. X litres of carbon monoxide is present at S.T.P. It is completely oxidised to CO_2. The volume of CO_2 formed is 11.207 L at S.T.P. What is the value of X in litres?

A. 22.414

B. 11.207

C. 5.6035

D. 44.828

Answer: B

Watch Video Solution

44. The volume of phosgene formed at STP when 11.2 lit of chlorine reacts with carbon monoxide is

A. 11.2 lit

B. 22.4 lit

C. 5.6 lit

D. 44.8 lit

Answer: A

View Text Solution

45. If 100 ml hydrogen chloride is completely decomposed the volume of H_2 formed will be (P and T are constant).

A. 20ml

B. 200ml

C. 100ml

D. 50ml

Answer: D

View Text Solution

46. The volume of H_2STP required to completely reduce 160 gms of Fe_2O_3 is

A. $3 \times 22.4L$

B. $2 \times 22.4L$

C. $22.4L$

D. $11.2L$

Answer: A

View Text Solution

47. The weight of SO_2 formed when 20gms of sulphur is burnt in excess of O_2 is

A. 32 gm

B. 64gm

C. 40gm

D. 60gm

Answer: C

Watch Video Solution

48. If 12.0 lit of H_2 and 8.0 lit of O_2 are allowed ot react, the O_2 left unreacted will be

A. 4.0 lit

B. 6.0 lit

C. 1.0 lit

D. 2.0 lit

Answer: D

Watch Video Solution

49. The volume in litre of CO_2 liberated at STP when 10g of 90% pure limestone is heated completely, is

A. 2.016

B. 20.16

C. 2.24

D. 22.4

Answer: A

Watch Video Solution

50. 26 cc of CO_2 are passed over red hot coke. The volume of `CO evolved is

A. 15 cc

B. 10cc

C. 32cc

D. 52cc

Answer: D

Watch Video Solution

51. When 10 ml of hydrogen and $12.5ml$ of chlorine are allowed to react the final mixture contains under the same conditions

A. 22.5 ml of HCl

B. 12.5 ml of HCl

C. 20 ml of HCl and 2.5 ml of chlorine

D. 20 ml of HCl nly

Answer: C

View Text Solution

52. If 0.7 moles of Barium Chlorine is treated with 0.4 mole of potassium sulphate, number of moles of barium sulphate formed are

A. 0.7

B. 0.4

C. 0.35

D. 0.2

Answer: B

View Text Solution

53. If 1.26 grams of oxalic acid is dissolved in 250 ml of solution then its normality is

A. 0.05

B. 0.04

C. 0.02

D. 0.08

Answer: D

Watch Video Solution

54. The mass of Na_2CO_3 required to prepare 500ml of $0.1M$ solution is

A. $10.6g$

B. $5.3g$

C. $2.65g$

D. $7.95g$

Answer: B

Watch Video Solution

55. Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution.

A. 0.2

B. 0.4

C. 0.1

D. 0.25

Answer: B

Watch Video Solution

56. Normality of 2% of H_2SO_4 solution by volume is nearly

A. 2

B. 4

C. 0.2

D. 0.4

Answer: D

View Text Solution

57. The molarity of pure water is

A. $100M$

B. $55.6M$

C. $50M$

D. $18M$

Answer: B

Watch Video Solution

58. Density of a solution containing $x\%$ by mass of H_2SO_4 is y.

The normality is

A. $\frac{xy \times 10}{98}$

B. $\frac{xy \times 10}{98y} \times 2$

C. $\frac{xy \times 10}{98} \times 2$

D. $\frac{x \times 10}{98y}$

Answer: C

View Text Solution

59. Number of gram equivalents of solute in 100ml of $5NHCl$ solution is

A. 50

B. 500

C. 5

D. 0.5

Answer: D

View Text Solution

60. A solution is prepared by adding 2g of substance A to 18g of water. The mass percent of the solute.

A. 10

B. 20

C. 40

D. 25

Answer: A

Watch Video Solution

61. The oxidation state of phosphours is minimum in

A. P_4O_6

B. NaH_2PO_2

C. PH_3

D. Na_3PO_4

Answer: C

View Text Solution

62. Oxidation state of phosphorus in pyrophosphate ion $\left(P_2O_7^{-4}\right)$ is

A. $+7$

B. $+3$

C. $+8$

D. $+5$

Answer: D

View Text Solution

63. The average oxidation state of sulphur in sodium tetrathonate $\left(Na_2S_4O_6\right)$ is :

A. $+2$

B. $+4$

C. $+1.5$

D. $+2.5$

Answer: D

Watch Video Solution

64. In $Ba\left(H_2PO_2\right)_2$ the oxidation number of phosphorous is

A. -3

B. $+1$

C. $+3$

D. $+5$

Answer: B

Watch Video Solution

65. When Cl^- ions are converted to Cl_2, the oxidation number of chlorine changes from

A. -1 to 0

B. -1 to $+1$

C. -1 to $+2$

D. -2 to 0

Answer: A

Watch Video Solution

66. $3Cu + 8HNO_3 \rightarrow 3Cu\left(NO_3\right)_2 + 2NO + 4H_2O$ the wrong statement for the value

A. Cu is oxidized

B. HNO_3 is reduced

C. Cu is reduced

D. Cu acts as reducing agent

Answer: C

Watch Video Solution

67. The oxidising agent in the reaction

$$2MnO_4^- + 16H^+ + 5C_2O_4^{-2} \rightarrow 2Mn^{+2} + 8H_2O + 10CO_2$$

A. MnO_4^-

B. H^+

C. $C_2O_4^{2-}$

D. Both 1 & 2

Answer: A

View Text Solution

68. Oxidation state of chlorine in hypochlorous acid

A. $+1$

B. $+3$

C. $+5$

D. $+7$

Answer: A

Watch Video Solution

69. In the reaction $NO_2^- + OCl^- \rightarrow NO_3^- + Cl^-$ the oxidate state of chlorine

A. Does not change

B. Changes from $+1$ to -1

C. Changes from -2 to -1

D. Changes from 0 to -1

Answer: B

View Text Solution

70. A metal ion M^{3+} loses three electrons , its oxidation number will be

A. 0

B. $+3$

C. $+6$

D. -3

Answer: C

Watch Video Solution

71. Oxidation state of carbon is not zero in

A. CH_2O

B. $C_6H_{12}O_6$

C. CH_2Cl_2

D. $CHCl_3$

Answer: D

Watch Video Solution

72. In which of the following processess is nitrogen oxidised ?

A. $NH_4^+ \rightarrow N_2$

B. $NO_3^- \rightarrow NO$

C. $NO_2 \rightarrow NO_2^-$

D. $NO_3^- \rightarrow NH_4^+$

Answer: A

Watch Video Solution

73. Which of the following has least oxidation state of Fe?

A. $K_4\left[Fe(CN)_6\right]$

B. $K_3\left[Fe(CN)_6\right]$

C. $FeSO_4\left(NH_4\right)_2SO_46H_2O$

D. $Fe_2(CO)_9$

Answer: D

Watch Video Solution

LEVEL-II(H.W)

1. Two student X and Y report the mass of the same substance as $7 \cdot 0g$ and $7 \cdot 00g$ repectively. Which of the following statement is correct?

A. Both are equally accurate

B. x' is more acurate than 'y'

C. y' is more accurate than 'x'

D. bothe are inaccurate scientifically

Answer: C

Watch Video Solution

2. $81.4g$ sample of enthyl ethyl alcohol contains $0.002g$ of water. The amount of pure ethyl alcohol to the proper number of significant figures is

A. $81.398g$

B. $81.40g$

C. $81.4g$

D. $81g$

Answer: C

Watch Video Solution

3. Two samples of lead oxide were separately reduced to metallic lead by heating in a current of hydrogen. The weight of

lead from one oxide was half the weight of lead obtained from the other oxide. The data illustrates

A. Reciprocal proportions

B. Constant proportions

C. Multiple proportions

D. Equivalent proportions

Answer: C

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4. The Rydberg's constant is $1.097373177 \times 10^{7} m^{-1}$. It can be expressed to three significant figures as

A. $1.0974 \times 10^{7} m^{-1}$

B. $1.09 \times 10^{7} m^{-1}$

C. $1.10 \times 10^{7} m^{-1}$

D. $1.10^{7} m^{-1}$

Answer: C

View Text Solution

5. The mass of piece of paper is $0.02g$ and the mass of a solid substance along with the same piece of paper is $20.036g$. If the volume of the solid is $2.16cm^{3}$, its densify to the proper number of significant digits will be

A. $9.27gcm^{-3}$

B. $9.3gcm^{-3}$

C. 9.267

D. $43.24cm^{-3}$

Answer: A

View Text Solution

6. Which one of the following pairs of compound illustrates the law of multiple proportion

A. H_2O, Na_2O

B. MgO, Na_2O

C. Na_2O, BaO

D. $SnCl_2, SnCl_4$

Answer: D

Watch Video Solution

7. Two oxides of a certain metal were separately heated in hydrogen till water is produced. It was observed that 1 gm of each oxide gave $0.125gm$ and 0.2263 grams of water respectively. This law states that it illustrate law of

A. Definite proportions

B. Multiple porportions

C. Reciprocal proportions

D. Conservation of mass

Answer: B

View Text Solution

8. $4 \cdot 4g$ of an oxide of nitrogen gives $2 \cdot 24L$ of nitrogen and 60 g of another oxide of nitrogen gives $22 \cdot 4L$ of nitrogen at S.T.P. The data illustrated

A. Conservation of mass

B. Multiple proprotions

C. Constant Proportions

D. Gaseous volume

Answer: B

Watch Video Solution

9. 2.16 grams of Cu on reaction with HNO_3 followed by ignition of the nitrate gave 2.7 gm of copper oxide. In another

experiment 1.15 gm of copper oxide upon reduction with hydrogen gave 0.92 gm of copper. This data illustrate the law of

A. Multiple Proportions

B. Definite Proportions

C. Reciprocal proportions

D. Conservation of mass

Answer: B

View Text Solution

10. Two metallic oxides contain $27.6\,\%$ and $30\,\%$ oxygen, respectively. If the formula of the second oxide is M_2O_3, that of the first will be

A. MO

B. MO_2

C. M_2O_3

D. M_2O

Answer: C

Watch Video Solution

11. The mass of nitrogen per gram in hydrazine is exactly one and half the mass of nitrogen in the compound ammonia. The fact illustrates the

A. Law of conservation of mass

B. Multiple valency of nitrogen

C. Law of multiple proportion

D. Law of definite Portin

Answer: C

View Text Solution

12. Irrespective of the source, pure sample of water always yields $88.89\ \%$ mass of oxygen and $11.11\ \%$ mass of hydrogen. This is explained by the law of

A. Conservation of mass

B. Constant proportions

C. Multiple proportions

D. Constant volume

Answer: B

Watch Video Solution

13. The oxides of nitrogen contain $63.65\,\%$, 46.69 and $30.64\,\%$ of nitrogen respectively. This data illustrate the law of

A. Constant Proportions

B. Multiple Proportions

C. Reciprocal Proportions

D. Conservation of mass

Answer: B

View Text Solution

14. The following data are available.

(i) % of Mg in MgO and in $MgCl_2$

(ii) % of C in CO & CO_2

(ii) % of Cr in $K_2Cr_2O_7$ and K_2CrO_4

(iv) % of Cu isotopes in Cu metal.

The law of multiple proportions may be illustrated by data.

A. i & ii

B. Only ii

C. i,ii & iii

D. Only iii

Answer: B

View Text Solution

15. The ratio of the mass of C-12 atom to that of an atom of element X (whose atomicity is four) is $1:9$. The molecular mass

of element x is :-

A. $480 gmol^{-1}$

B. $432 gmol^{-1}$

C. $36 gmol^{-1}$

D. $84 gmol^{-1}$

Answer: B

Watch Video Solution

16. Study the following table: Which two compounds have least weight of oxygen (molecular weights of compounds are given

in brackets)

	Compound (M.Wt.)	Weightof compound in g. taken
I)	CO_2 (44)	4.4
II)	NO_2 (46)	2.3
III)	H_2O_2 (34)	6.8
IV)	SO_2 (64)	1.6

A. II & IV

B. I & III

C. I & II

D. III & IV

Answer: A

Watch Video Solution

17. Which of the following contain 9×10^{23} oxygen atoms?

A. 0.25 moles of glucose

B. 0.5 moles of ethyl alcohol

C. 1.0 mole of dimethyl ether

D. 0.01 moles of sucrose

Answer: A

Watch Video Solution

18. Number of gram atoms of oxygen present in 0.3 mole of $(COOH)_2.2H_2O$ is

A. 9

B. 18

C. 0.9

D. 1.8

Answer: D

Watch Video Solution

19. Ordinary water contain one part of heavy water per 6000 parts by weight. The number of heavy water molecules present in drop of water of volume 0.01 ml is (Density of water is $1gm/ml$)

A. 2.5×10^{16}

B. 2.5×10^{17}

C. 5×10^{16}

D. 7.5×10^{16}

Answer: C

View Text Solution

20. No. of moles of water in 488.6 gms of $BaCl_2.2H_2O$ are (molecular weight of $BaCl_2.2H_2O = 244.33$)

A. 2 moles

B. 4 moles

C. 3 moles

D. 5 moles

Answer: B

Watch Video Solution

21. Equivalent weight of metal 'M' is 12. Equivalent weight of Y in the compound MY_2 is (M.W of MY_2 is 36)

A. 24

B. 6

C. 12

D. 16

Answer: B

Watch Video Solution

22. The oxide of an element possesses the formula MO_2. If the equivalent mass of the metal is 9. then the atomic mass of the metal will be

A. 9

B. 18

C. 27

D. 36

Answer: D

Watch Video Solution

23. One mole of chlorine combines with certain weight of metal giving 111 gm of its chloride. The same amount of metal can displace. 2gm hydrogen from an acid. The equivalent weight of metal is

A. 40

B. 20

C. 80

D. 10

Answer: B

View Text Solution

24. $3g$ of an oxide of a metal is converted completely to $5g$ chloride. Equivalent weight of metal is:

A. 3.325

B. 66.50

C. 33.25

D. 25.33

Answer: C

Watch Video Solution

25. An oxide of nitrogen contains $36.8\ \%$ by weight of nitrogen. The formula of the compound is

A. N_2O

B. N_2O_3

C. NO

D. NO_2

Answer: B

View Text Solution

26. A compound contains 28% N and 72% of a metal by weight . Three atoms of metal combine with two atoms of N . Find the atomic weight of metal.

A. 12

B. 24

C. 36

D. 48

Answer: B

Watch Video Solution

27. An organic compound contains $40\ \%\ C, 6.6\ \%\ H.$ The empirical formula of the compound is

A. CH_2

B. CH_2O

C. CHO

D. CHO_2

Answer: B

Watch Video Solution

28. If $75.2\ \%$ of compound is carbon and the rest of the weight is hydrogen, the formulaof the compound is

A. C_3H_6

B. C_2H_2

C. C_2H_4

D. CH_4

Answer: D

View Text Solution

29. X and Y are two different elements having their atomic masses in 1:2 ratio. The compound formed by the combination of X and Y contains 50% of X by weight. The empirical formula of the compound is

A. X_2Y

B. XY_2

C. XY

D. X_4Y

Answer: A

Watch Video Solution

30. 15 cc of gaseous hydrocarbon required 45 cc of oxygen for complete combusion if 30 cc of CO_2 is formed, the formula of the gaseous compound is

A. C_3H_6

B. C_2H_2

C. C_4H_{10}

D. C_2H_2

Answer: D

View Text Solution

31. $0.132g$ of an organic compound gave $50ml$ of N_2 at NTP. The weight percentage of nitrogen in the compound is close to

A. 15

B. 20

C. 48.9

D. 47.43

Answer: D

View Text Solution

32. A gas mixture contains accetylene and carbondioxide. 20 litres of this mixture required 20 litres of oxygen for complete combustion. If all gases are measured under similar conditions of temperature and pressure, the percentage of acetylene in the mixture is

A. 50 %

B. 40 %

C. 60 %

D. 75 %

Answer: B

View Text Solution

33. When $4g$ of iron is burnt to ferric oxide at constant pressure, $29.28KJ$ of heat is evolved. What is the enthalpy of formation of ferric oxide (At wt. of $Fe = 56$)

A. $819.84kJ$

B. $40.99kJ$

C. $81.98kJ$

D. $409.0kJ$

Answer: A

Watch Video Solution

34. 40 ml of a hydrogen undergoes combustion in 260 ml of oxygen and gives 160 ml of carbondioxide. If all gases are measured under similar conditions of temperature and pressure the formula of hydrocarbon is

A. C_3H_8

B. C_4H_8

C. C_6H_{14}

D. C_3H_{10}

Answer: D

View Text Solution

35. The sulphur dioxide obtained by the combustion of 8 gms of sulphur is passed into Bromine water. The solution is then treated with barium chloride solution. The amount of barium sulphare formed is

A. 1 mole

B. 0.5 mole

C. 0.25 gms

D. 0.25 gm moles

Answer: D

View Text Solution

36. Phosphine on decomposition produces phosphorus and hydrogen. The change in percentage in volume

A. 50ml

B. 80ml

C. 900ml

D. 75ml

Answer: A

View Text Solution

37. 0.7 moles of potassium sulphate is allowed to react with 0.9 moles of barium chloride in aqueous solutions. The number of

moles of the substance precipitated in the reaction is

A. 1.4 moles of potassium chloride

B. 0.7 moles of barium sulphate

C. 1.6 moles of potassium chloride

D. 1.6 moles of barium sulphate

Answer: B

View Text Solution

38. X' grams of calcium carbonate was completely burnt in air. The weight of the solid residue formed is 28 g. What is the value of "X'(in grams)?

A. 44

B. 200

C. 150

D. 50

Answer: D

Watch Video Solution

39. When oxalic acid is heated with concentrated H_2SO_4 it produces

A. CO

B. CH_4

C. CO_2

D. C_2H_4

Answer: A

Watch Video Solution

40. Which of the following solutions has the highest normality ?

A. 172 milli equivalents in 200ml

B. 84 milli equivalents in 100ml

C. 275 milli equivalents in 250 ml

D. 43 milli equivalents in 60 ml

Answer: C

Watch Video Solution

41. 12 ml of $0.25NH_2SO_4$ is neutralised with 15 ml of sodium hydroxide solution on titration, then the normality of NaOH solution is

A. $0.4N$

B. $0.2N$

C. $0.1N$

D. $0.05N$

Answer: B

Watch Video Solution

42. The specific gravity of H_2SO_4 is $1.8g/cc$ and this solution is found to contain $98\ \%\ H_2SO_4$ by weight. $10cc$ of this solution is mixed with $350cc$ of pure water. $25mL$of this dil. H_2SO_4 solution

neutralises $500mL$ of $NaOH$ solution. Then the P^H of $NaOH$ solution is

A. 0.2

B. $0.5M$

C. $0.1M$

D. $1M$

Answer: B

Watch Video Solution

43. What volume of $75\ \%\ H_2SO_4$ by mass is required to prepare 1.5 litres of $0.2MH_2SO_4$? (Density of the sample is $1.8g/cc$)

A. 14.2 cc

B. 28.4 cc

C. 21.7 cc

D. 7.1 cc

Answer: C

Watch Video Solution

44. 4.9 g of H_2SO_4 is present in 100 mL of the solution. What is the molarity of the solution ? Calculate its normality also.

A. 1,0.5

B. 1,1

C. 0.5,1

D. 0.5,2

Answer: C

Watch Video Solution

45. How many grams of methanol would have to be added to water to prepare 150mL of solution which is $2MCH_3OH$?

A. 9.6

B. 2.4

C. 9.6×10^3

D. 4.3×10^2

Answer: A

Watch Video Solution

46. What weight of sodium hydroxide is required to neutralise 100 ml of $0.1NHCl$?

A. 4g

B. 0.4g

C. 0.04g

D. 40g

Answer: B

Watch Video Solution

47. Which of the following has the highest normality ? (consider each of the acid is 100% ionised)

A. 8 gr KOH per $100ml$

B. $0.5MH_2SO_4$

C. 6gr of $NaOH$ per 100 ml

D. $1NH_3PO_4$

Answer: C

Watch Video Solution

48. What is the concentration of sugar $\left(C_{12}H_{22}O_{11}\right)$ in $molL^{-1}$ if its $20g$ are dissolved in enough water to make a final volume up to $2L$?

A. 0.092

B. 0.029

C. 0.059

D. 0.069

Answer: B

Watch Video Solution

49. The weight of oxalic acid required to reduce 80 ml of 0.4 M $KMnO_4$ in acidic medium is

A. $10.08g$

B. $7.21g$

C. $16.28g$

D. $12.4g$

Answer: A

Watch Video Solution

50. The volume of water to be added to 400 ml of $N/8HCI$ to make it exactly $N/12$ is

A. $400ml$

B. $300ml$

C. $200ml$

D. $100ml$

Answer: C

Watch Video Solution

51. 0.1N solution of a dibasic acid can be prepared by dissolving $0.45gm$ of the acid in water and diluting to 100ml. The molecular mass of the acid is

A. 45

B. 90

C. 135

D. 180

Answer: B

Watch Video Solution

52. To neutralize completely 20 mL of 0.1M aqueous solution of phosphorus acid $\left(H_3PO_3\right)$ the volume of $0.1M$ aqueous KOH solution required is

A. $10mL$

B. $20mL$

C. $40mL$

D. $60mL$

Answer: C

Watch Video Solution

53. A solution is prepared by adding 2g of substance A to 18g of water. The mass percent of the solute.

A. 10

B. 20

C. 40

D. 25

Answer: A

Watch Video Solution

54. Mark the element which shows only one oxidation state in its compounds

A. Hydrogen

B. Oxygen

C. Nitrogen

D. Fluorine

Answer: D

Watch Video Solution

55. The oxiation number of manganese in potassium manganate is

A. $+7$

B. $+6$

C. $+4$

D. $+2$

Answer: B

Watch Video Solution

56. In the reaction $2BaO_2 \rightarrow 2BaO + O_2$ the oxidation number of Barium

A. Decreases from $+4$ to $+2$

B. Decreases from $+2$ to 0

C. Increases from -4 to -2

D. Does not change

Answer: D

Watch Video Solution

57. $KMnO_4$ is a strong oxidising agent in acidic medium. To provide acidic medium H_2SO_4 is used instead of HCl. This is because

A. H_2SO_4 is a stronger acid than HCl

B. HCl is oxidised by $KMnO_4$ to Cl_2

C. H_2SO_4 is a dibasic acid

D. rate is faster in the presence of H_2SO_4

Answer: B

Watch Video Solution

58. In the reaction,

$KMnO_4 + 16HCl \rightarrow 5C1_2 + 2MnCl_2 + 2KCl + 8H_2O$ the reduction product is

A. Cl_2

B. $MnCl_2$

C. H_2O

D. KCl

Answer: B

Watch Video Solution

59. A compound of Xe and F is found to have 53.5% Xe. What is the oxidation number of Xe in this comound?

A. -4

B. 0

C. +4

D. +6

Answer: D

Watch Video Solution

60. In this reaction: $S_2O_8^{2-} + 2I^- \rightarrow 2SO_4^{2-} + I_2$

A. Oxidation of iodide into iodine takes place

B. Reduction of iodine into iodide takes place

C. Both oxidation ane reduction of iodine takes place

D. None of the above

Answer: A

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61. The oxidation states of sulphur in the anions SO_3^{2-}, $S_2O_4^{2-}$, and $S_2O_6^{2-}$ follow the order

A. $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$

B. $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$

C. $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$

D. $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$

Answer: A

Watch Video Solution

62. In the coordination compound, $K_4\left[Ni(CN)_4\right]$ oxidation state of nickel is

A. -1

B. 0

C. +1

D. +2

Answer: B

Watch Video Solution

63. What is the oxidation number of chlorine in ClO_3^- ?

A. $+5$

B. $+3$

C. $+4$

D. $+2$

Answer: A

Watch Video Solution

64. In a balanced equation $H_2SO_4 + xHI \rightarrow H_2S + YI_2 + zH_2O$, the value of x, y, z are

A. $x = 3, y = 5, z = 2$

B. $x = 4, y = 8, z = 5$

C. $x = 8, y = 4, z = 4$

D. $x = 5, y = 3, z = 1$

Answer: C

Watch Video Solution

LEVEL -V

1. 21.6 g of silver coin is dissolved in HNO_3. When NaCl is added to this solution, all silver is precipitated as AgCl. The weight of AgCl is found to be 14.35g then % silver in coin is:

$$Ag + HNO_3 \xrightarrow{NaCl} AgCl$$

A. 50 %

B. 75 %

C. 100 %

D. 15 %

Answer: A

Watch Video Solution

2. Volume $V_1 mL$ of 0.1 M $K_2Cr_2O_7$ is needed for complete oxidation of 0.678g N_2H_4 in acidic medium. The volume of 0.3M $KMnO_4$ needed for same oxidation in acidic medium will be :

A. $\frac{2}{5}V_1$

B. $\frac{5}{2}V_1$

C. $113V_1$

D. can't say

Answer: A

Watch Video Solution

3. $25ml$ of a $0.1(M)$ solution of a stable cation of transition metal z reacts exactly with $25ml$ of $0.04(M)$ acidified $KMnO_4$ solution. Which of the following is most likely to represent the change in oxidation state of Z correctly?

A. $Z^+ \rightarrow Z^{2+}$

B. $Z^{2+} \rightarrow Z^{3+}$

C. $Z^{3+} \rightarrow Z^{4+}$

D. $Z^{2+} \rightarrow Z^{4+}$

Answer: D

Watch Video Solution

4. 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

B. 140

C. 105

D. 210

Answer: B

Watch Video Solution

5. A spherical ball of radius $7cm$ contains $56\ \%$ iron. If density is $1.4g/cm^3$, number of mol of Fe present approximately is :

A. 10

B. 15

C. 20

D. 25

Answer: C

Watch Video Solution

6. 10 mL of $N/20NaOH$ solution is mixed with 20 mL of $N/20HCI$ solution. The resulting solution will :

A. $40mL$

B. $20mL$

C. $30mL$

D. $5mL$

Answer: A

Watch Video Solution

7. A solution containing 0.05 mole of SO_2CI_2 in water will be completely neutralized by

A. 50ml of $4.0MNaOH$

B. 25ml of $0.2MKMnO_4$

C. 50ml of $0.5MKOH$

D. 50ml of $1MKOH$

Answer: A

Watch Video Solution

8. The volume of 0.5 M H_3PO_4 that completely dissolved 3.1 g of copper carbonate is (molecular mass of copper carbonate $= 124gmol^{-1}$)

A. $55.5mL$

B. $45.5mL$

C. $35.5mL$

D. $33.3mL$

Answer: D

Watch Video Solution

9. The mass of $K_2Cr_2O_7$ required to produce 5.0 L CO_2 at $77^\circ C$ and 0.82 atm pressure from excess of oxalic acid and volume of 0.1 N $NaOH$ required to neutralise the CO_2 evolved respectively are

A. $7g$, $2.86L$

B. $5g$, $1.86L$

C. $4g$, $0.86L$

D. $14g$, $2.86L$

Answer: D

Watch Video Solution

10. Washing soda $\left(Na_2CO_3.10H_2O\right)$ is widely used in softening of hard waer. If 1 L of hard water requires 0.0286 g of washing soda, the hardness of $CaCO_3$ in ppm is

A. 10ppm

B. 5 ppm

C. 8ppm

D. 6ppm

Answer: A

Watch Video Solution

11. $0.63g$ of diabasic acid was dissolved in water. The volume of the solution was made $100mL$. $20mL$ of this acid solution

required $10mL$ of $N/5NaOH$ solution. The molecular mass of acid is:

A. 3

B. 6

C. 12

D. 24

Answer: C

Watch Video Solution

12. A gaseous mixture of propane and butane of volume 3 litre on complete combustion produces

11.0 litre CO_2 under standard conditions of temperature and

pressure.

The ration of volume of butane to propane is:

A. $1:2$

B. $2:1$

C. $3:2$

D. $3:1$

Answer: B

Watch Video Solution

13. If 0.1 mole H_3PO_x is completely neutralised by 5.6g KOH then select the true statement.

A. $x = 3$ and given acid is dibasic

B. $x = 4$ and given acid has no P-H linkage

C. $x = 2$ and given acid does not form acid salt

D. $x = 4$ and given acid has P-H linkage

Answer: C

Watch Video Solution

14. 1 mol of H_3PO_2, H_3PO_3 and H_3PO_4 will neutralise x mol $NaOH$, y mol of $Ca(OH)_2$ and z mol of $Al(OH)_3$ respectively (assuming all as strong electrolytes). x, y, z are in the ratio of:

A. $3:1, 5:1$

B. $1:2:3$

C. $3:2:1$

D. $1:1:1$

Answer: D

Watch Video Solution

15. If equal volumes of 1 M $KMnO_4$ and 1M $K_2Cr_2O_7$ solutions are allowed to oxidise Fe(II) to Fe(III) in acidic medium, then Fe(II) oxidised will be

A. more with $KMnO_4$

B. more with $K_2Cr_2O_7$

C. equal with both oxidizing agents

D. cannot be determined

Answer: B

Watch Video Solution

16. "Calculate valency factor and equivalent wieght of the following" Na_2CO_3, $Fe_2(SO_4)_3$, $FeSO_4.7H_2O$

A. n-factor for Hydroxyl amine is 1

B. equivalent weigth of $Fe_2(SO_4)_3$ is $M/2$

C. 6 meq of $Fe_2(SO_4)_3$ is contained in 3 millimoles of ferric sulphate

D. all of these

Answer: D

Watch Video Solution

17. When $100mL$ of an aqueous of H_2O_2 is titrated with an excess of KI solution in dilute H_2O_2, the liberated I_2 required $50mL$ of $0.1MNa_2S_2O_3$ solution for complete reaction. Calculate the percentage strength and volume strength of H_2O_2 solution.

A. 10 %

B. 20 %

C. 5 %

D. 40 %

Answer: A

Watch Video Solution

18. 0.80g of impure $\left(NH_4\right)_2SO_4$ was boiled with 100mL of a 0.2N NaOH solution was neutralized using 5mL of a $0.2NH_2SO_4$ solution. The percentage purity of the $\left(NH_4\right)_2SO_4$ sample is:

A. 82.5

B. 72.5

C. 66.5

D. 17.5

Answer: A

Watch Video Solution

19. A mixture of $H_2C_2O_4$ and $K_2C_2O_4$ required 0.2 N, 25mL $KMnO_4$ solution for complete oxidation. Same mixture needs

0.2 M,20 mL NaOH solution for its complete neutralisation. Calculate mole percentage of $H_2C_2O_4$ in the given mixture.

A. 90 %

B. 26.8 %

C. 40 %

D. 50 %

Answer: B

Watch Video Solution

20. A mixture of $H_2C_2O_4$ and $NaHC_2O_4$ weighing $2.02g$ was dissolved in water and the solution made uptp one litre. $10mL$ of this solution required $3.0mL$ of $0.1NNaOH$ solution for complete neutralization. In another experiment $10mL$ of same

solution in hot dilute H_2SO_4 medium required $4mL$ of $0.1NKMnO_4KMnO_4$ for compltete neutralization. Calculate the amount of $H_2C_2O_4$ and $NaHC_2O_4$ in mixture.

A. 0.1, 0.1

B. 0.1, 0.05

C. 0.05, 0.1

D. 0.05, 0.05

Answer: D

Watch Video Solution

21. $500ml$ of $0.1MKCI, 200ml$ of $0.01MNaNO_3$ and $500ml$ of $0.1MAgNO_3$ was mixed. The molarity of $K^+, Ag^+, CI^-, Na^+, NO_3^-$ in the solution would be

A. $\left[K^{+}\right]=0.04, \left[Ag^{+}\right]=0.04, \left[Na^{+}\right]=0.002$

B. $\left[K^{+}\right]=0.04, \left[Na^{+}\right]=0.00166, \left[NO_3^{-}\right]=0.04333$

C. $\left[K^{+}\right]=0.04, \left[Ag^{+}\right]=0.05, \left[Na^{+}\right]=0.0025$

D.

$\left[K^{+}\right]=0.05, \left[Na^{+}\right]=0.0025, \left[Cl^{-}\right]=0.05, \left[NO_3^{-}\right]=0.0525$

Answer: B

Watch Video Solution

22. The volume of 0.1M H_2SO_4 solution required to neutralise 50ml of 0.2M NaOH solution is -

A. 60ml

B. 30ml

C. 40ml

D. 100ml

Answer: C

Watch Video Solution

23. What volume of $0.2MBa\left(MnO_4\right)_2$ solution is required for complete oxidation of 25 gm of 89.6 % pure $FeCr_2O_4$ in acidic medium according to the reaction

$$MnO_4^- + FeCr_2O_4 \rightarrow Fe^{+3} + Cr_2O_7^{-2} + Mn^{+2}$$

A. $700ml$

B. $175ml$

C. $350ml$

D. $200ml$

Answer: C

View Text Solution

24. A sample containing $0.496gm$ of $\left(NH_4\right)_2C_2O_4(MW = 124)$ and inert material was dissolved in water and made strongly alkaline with KOH which converts NH_4^+ into NH_3. The liberated NH_3 was distilled into exactly 50ml of $0.05MH_2SO_4$. The excess H_2SO_4 was back titrated with 10ml of $0.1MNaOH$. The percentage of $\left(NH_4\right)_2C_2O_4$ with sample is

A. 40 %

B. 50 %

C. 60 %

D. 75 %

Answer: B

View Text Solution

25. A $0.1g$ sample of pyrolusite ore containing $MnO_2(MW = 87)$ was dissolved in a concentrated HCI solutiona and liberated $CI_2(g)$ was passed through a concentrated KI solution releasing I_2 if the liberated iodine required 16 ml of $1.25M$ sodium thiosulphate $\left(Na_2S_2O_3\right)$ solution, mass percentage of MnO_2 in the given sample is

A. 43.5 %

B. 87 %

C. 21.75 %

D. 0.875 %

Answer: B

View Text Solution

26. 1 mole of equimolar mixture of ferric oxalate and ferrous oxalate requres x mole of $KMnO_4$ in acidic medium for complete oxidation. X is:

A. 1.5m moles

B. 7.5m moles

C. 3m moles

D. 2.64 m moles

Answer: D

Watch Video Solution

27. V_1 ml of NaOH of molarity X and V_2 ml of $Ba(OH)_2$ of molarity $\frac{y}{2}$ are mixed together. Mixture is completely neutralized by 100 ml $\frac{0.1}{2}$M H_2SO_4/. If $\frac{V_1}{V_2} = \frac{1}{4}$ and $\frac{x}{y} = 4$, what fraction of acid is neutralized by $Ba(OH)_2$?

A. 0.5

B. 0.25

C. 0.33

D. 0.67

Answer: D

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28. A $0.518g$ sample of limestone is dissolved in HCl and then the calcium is precipitated as CaC_2O_4. After filtering and washing the precipitate, it requires 40.0 filtering and washing the precipitate, it requires $40.0mL$ of $0.250NKMnO_4$, solution acidified with H_2SO_4 to titrate it as. The percentage fo CaO in the sample is:

$$MnO_4^- + H^+ + C_2O_4^{2-} \rightarrow Mn^{2+} + CO_2 + 2H_2O$$

A. $54.0\ \%$

B. $27.1\ \%$

C. $42\ \%$

D. $84\ \%$

Answer: A

Watch Video Solution

29. When 100 " mL of " 0.1 M $Ba(OH)_2$ is neutralised with a mixture of x " mL of " 0.1 M HCl and y " mL of " 0.2 M H_2SO_3 using methyl orange indicator what is value of x and y?

A. 200, 100

B. 100200

C. 300200

D. 200300

Answer: A

Watch Video Solution

30. A mixed solution of potassium hydroxide and sodium carbonate required 15 mL of an N/20 HCl solution when

titrated with phenolphthalein as an indicator. But the same amount of the solution, when titrated with methyl orange as an indicator , required 25 mL of the same acid. The amount of KOH present in the solution is :

A. $0.014g$

B. $0.14g$

C. $0.028g$

D. $1.4g$

Answer: A

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31. Bottle (A) contains 320 mL of H_2O_2 solution and labelled with 10 V H_2O_2 and bottle (B) contains 80 mL H_2O_2 having

molarity 2.5 M. Content of bottle (A) and bottle (B) are mixed and solution is filled in bottle (C). Select the correct label for bottle (C) in terms of volume strength and g/litre. (Assume 1 mole of an ideal gas occupies 22.4 L at STP)

A. $13.6V$ & $41.285g/L$

B. $11.2V$ & $0.68g/L$

C. $5.6V$ & $0.68g/L$

D. $5.6V$ & $41.285g/L$

Answer: A

Watch Video Solution

32. When a equimolar mixture of Cu_2S and CuS is tirated with $Ba\left(MnO_4\right)_2$ in acidic medium, the final products cintain Cu^{2+},

So_2 and Mn^{2+}. If the mol. Mass of Cu_2S, and $Ba\left(MnO_4\right)_2$ are M_1 , M_2 and M_3 respectively then :

A. Equivalent weight of Cu_2S is $\frac{1}{8}$

B. Equivalent weight of CuS is $M_2/5$

C. Equivalent weight of $AI\left(MnO_4\right)_3$ is $M_3/5$

D. Equivalent weight of $AI\left(MnO_4\right)_3$ is $M_3/15$

Answer: A::D

Watch Video Solution

33. Equivalent weight of FeS_2 in the half reaction

$FeS \rightarrow Fe_2O_3 + SO_2$ is :

A. equivalent wt. of FeS_2 is $M/11$

B. the molar ratio of FeS_2 to O_2 is 4:11

C. the molar ratio of FeS_2 to O_2 is $11:4$

D. The molar ratio of Fe_2O and SO_2 is $1:4$

Answer: A::B::D

Watch Video Solution

34. 150 ml $\frac{M}{10}Ba\left(MnO_4\right)_2$ in acidic medium can oxidise completely

A. $150mL1MFe^{+2}$

B. $50mL1MFeC_2O_4$

C. $75mL1MC_2O_4^{-2}$

D. $25mL1MK_2Cr_2O_7$ solution

Answer: A::B::C::D

Watch Video Solution

35. 40g NaOH, 106g Na_2CO_3 and 84g $NaHCO_3$ is dissolved in water and the solution is made 1 litre. 20 mL of this stock solution is titrated with 1N HCl, hence which of the following statements is/are correct?

A. The litre reading of HCI will be 40mL, if phenolphthalein is used indicator from the very beginning

B. The litre reading of HCI will be 60mL if phenolphthalein is used indicator from the very beginning

C. The litre reading of HCI will be $40mL$ if the methyl orange is used indicaor after the 1^{st} end point

D. The tire reading HCI will be $80mL$ if methyl orange is used as indicator from the very beginning

Answer: A::D

Watch Video Solution

36. `{:(CH_(2)COOH),(|),(C(OH)COOH),(|),(CH_(2)COOH) :}

A. When behaves as reducing agent, then its equivalent weights are equal to half of its molecular weight respectively

B. $1000mL$ of 1N solution of each is neutralized by $1000mL1NCa(OH)_2$

C. $1000mL$ of $1M$ solution is neutralized by $1000mL$ of $1MCa(OH)_2$

D. $1000mL$ of 1M solution is neutralized by $200mL2M$ of $KMnO_4$ in acidic medium.

Answer: A::B::D

Watch Video Solution

37. The reaction

$$H_3PO_4 + Ca(OH)_2 \rightarrow Ca\left(HPO_4\right)_2 + 2H_2O$$

Which statements (s) is (are)true?

A. the equivalent weight of H_3PO_4 is 49

B. the resulting solution is neutralized by 1 mole of KOH

C. 1 mole of H_3PO_4 is completely neutralized by 1.5 mole of $Ca(OH)_2$

D. 1 mole of H_3PO_4 can be neutralised completely by 1 mole of $Ca(OH)_2$

Answer: A::B::C

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38. 1 L sample of impure water containing sulphide ion is made ammoniacal and is titrated with 300 " mL of " 0.1 M $AgNO_3$ solution. Which of the following statements is/are correct about the above reaction?

A. The strength of H_2S in water is $0.51gL^{-}$

B. The strength of H_2S in water is $5.1gL^{-1}$

C. The conc.of H_2S in water in ppm is 510

D. The conc.of H_2S in water in ppm is 51

Answer: A::C

Watch Video Solution

39. $H_3PO_2 + CuSO_4 \rightarrow Cu \downarrow + H_3PO_4 + HNO_3$

A. The number of moles of $Cr_2O_7^{2-}$ required to oxidise 6 mol of Cu_3P to $CuSO_4$ and H_3PO_4 is 11 mol.

B. The number of moles of H_2SO_4 used in the reaction is 62

C. The number of moles of $Cr_2\left(SO_4\right)_3$ formed in the reaction is 11

D. The number of moles of K_2SO_4 formed in the reaction is

11

Answer: A::B::C::D

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40. xg of H_2O_2 requires $100mL$ of $M/5KMnO_4$ in a titration in a solution having $pOH = 1.0$ Which of the following is/are correct?

A. The value of x is $1.7g$

B. The value of x is $0.34g$

C. MnO_4^- changes to MnO_4^{2-}

D. H_2O_2 changes to O_2

Answer: B::C::D

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41. Which of the following is/are correct about the redox reation?

$$MnO_4^- + S_2O_3^{2-} + H^{\oplus} \rightarrow Mn^{2+} + S_4O_6^{2-}$$

A. 1 mol of $S_2O_3^{2-}$ is oxidised by 8 mol of MnO_4^-

B. The above redox reaction with the change of pH from 4 to 10 will have and effect on the stiochiometry of the reaction

C. Change of pH from 4 to 7 will change the nature of the product

D. At $pH = 7$, $S_{20O_3^{2-}}$ ions are oxidised to HSO_4^-

Answer: B::C::D

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42. Three different solution of oxidising agents. $K_2Cr_2O_7, I_2,$ and $KMnO_4$ is titrated separately with $0.19 gof K_2S_2O_3$. The molarity of each oxidising agent is 0.1 M and the reaction are:

(i). $Cr_2O_7^{2-} + S_2O_3^{2-} \rightarrow Cr^{3+} + SO_4^{2-}$

(ii). $I_2 + S_2O_3^{2-} \rightarrow I^{\ominus} + S_4O_6^{2-}$

(iii). $MnO_4^{\ominus} + S_2O_3^{2-} \rightarrow MnO_2 + SO_4^{2-}$

(Molecular weight of $K_2S_2O_3 = 190, K_2Cr_2O_7 = 294, KMnO_4 = 158,$ and $I_2 = 254 mol^{-1}$)

Which of the following statements is/are correct?

A. All three oxidants can act as self-indicators

B. Volume of I_2 used is minium

C. Volume of $K_2Cr_2O_7$ used is maximum

D. Wt. of $KMnO_4$ used in the titration is max

Answer: A::B::D

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43. 0.1M solution of KI reacts with excess of H_2SO_4 and KIO_3 solutions, according to equation

$5I^- + IO_3^- + 6H^+ \rightarrow 3I^2 + 3H_2O$, which of the following statements is /are correct:

A. 200mL of the KI solution react with 0.004 mole KIO_3

B. 100mL of the KI solution reacts with 0.006 mole of H_2SO_4

C. 0.5 litre of the KI solution produced 0.005 mole of I_2

D. Equivalent weight of KIO_3 is equal to $\left(\frac{\text{Molecular weight}}{5}\right)$

Answer: A::B::D

Watch Video Solution

44. 18 " mL of " 1.0 M Br_2 solution undergoes complete disproportionation in basic medium to $Br^{Thehard \neq ssofwater \in termsof}$ and $BrO_3^{\ominus}$. Then the resulting solution required 45 " mL of " As^{3+} solution to reduce $BrO_3^{\ominus}$ to $Br^{\ominus}$. As^{3+} is oxidised to As^{5+} which statements are correct?

A. $Ew\left(Br_2\right) = \frac{M}{10}$

B. $Ew\left(Br_2\right) = \frac{5M}{3}$

C. Molarity of $As^{+3} = 0.4M$

D. Molarity of $As^{3+} = 0.2M$

Answer: B::C

Watch Video Solution

45. Statement Equivalent weight of a species can be written as molecular weight of species divided by valence factor.

Explanation Valence factor represents valence in element, acidity in bases, basicity in acids and total charge on cation or anion in an ionic compound.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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46. Statement-1 : The percentage of nitrogen in Urea is approximately $46.6\ \%$.

Statement-2 : Urea is an ionic compound.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-2

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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47. Statement-1 : Molarity of a solution and molality of a solution both change with density.

Statement-2 : Density of the solution changes when percentage by mass of solution changes.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-3

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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48. Statement H_3PO_3 is a dibasic acid and its salt Na_2PO_3 does not exist.

Explanation Being dibasic nature, only two H are replaceable.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-4

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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49. Statement Addition of water to a solution containing solute and solvent changes its normality or molarity only.

Explanation The milli-equivalent and milli-moles of solutes are not changed on dilution.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-5

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

50. Statement Addition of water to a solution containing solute and solvent changes its normality or molarity only.

Explanation The milli-equivalent and milli-moles of solutes are not changed on dilution.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-6

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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51. Assertion : The molality of the solution does not change with change in tempc- nature.

: The molality is expressed in units of moles per 1000 g of solvent. Reason

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-7

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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52. In the reaction,

$$FeS_2 + KMnO_4 + H^+ \rightarrow Fe^{3+} + SO_2 + Mn^{2+} + H_2O$$

the equivalent mass of FeS_2 would be equal to :

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-8

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

53. Statement H_3BO_3 is monobasic Lewis acid but its salt Na_3BO_3 exist.

Explanation H_3BO_3 reacts with $NaOH$ to give Na_3BO_3.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-9

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: C

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54. Statement $109\,\%\,H_2SO_4$ represent a way to express concentration of industrial H_2SO_4.

Explanation It represents that $9g\ H_2O$ reacts with $40g\ SO_3$ to produce $49g\ H_2SO_4$ in addition to $100g\ H_2SO_4$.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct

B. Statement -1 is True, Statement -2 is True, statement -2 is NOT a correct explanation for Statement-10

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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55. consider the following reaction,

$Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2$

Equivalent weight of Na_2CO_3 is

A. $0.05M$

B. $0.5M$

C. $5M$

D. can not be calculated

Answer: A

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56. 20 ml of the solution containg Na_2CO_3 and $NaHCO_3$ is titrated with $0.1MHCI$ using Phenolphthalein indicator the end point was $10ml.\ 20ml$ of the same solution is titrated with $0.1MHCI$, the end point was 25ml with Methylorange indicaor from the begining.

$$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$$

$$Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$$

What is amount of $NaHCO_3$ present in 1 litre of solution

A. $2.1g$

B. $1.05g$

C. $8.1g$

D. $0.844g$

Answer: A

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57. 20 ml of the solution containg Na_2CO_3 and $NaHCO_3$ is titrated with $0.1MHCI$ using Phenolphthalein indicator the end point was $10ml.\,20ml$ of the same solution is titrated with $0.1MHCI$, the end point was 25ml with Methylorange indicaor from the begining.

$$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$$

$$Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$$

What amount of $NaOH$ is required to convert $NaHCO_3$ to Na_2CO_3 in 1 litre of solution

A. $2g$

B. $20g$

C. $1g$

D. $0.5g$

Answer: C

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58. Direct titration of I_2 with a reducing agent is called iodimetry. If I_2 is leberated by the oxidation of $I_{\ominus}$ ion by a strong oxidising agent in neutral or acidic medium, the liberated I_2 is then titrated with reducing agent. Iodometry is used to estimate the strngth of the oxidising agent. For example, in the estimation of Cu^{2+} with $S_2O_3^{2-}$

$Cu^{2+} + I^{\ominus} \rightarrow CuI_2 + I_2$ (iodometry)

$I_2 + S_2O_3^{2-} \rightarrow S_4O_6^{2-} + I^{\ominus}$ (iodimetry)

Strach is used as an indicator at the end point, which forms

bluecoloured complex with $I_3^{\ominus}$ Disappearance of blue colourindicates the end point whe free I_2 in not present.

Q. In the reaction

$$2CuSO_4 + 4KI \rightarrow Cu_2I_2 + 2K_2SO_4 + I_2$$

The equivalent weight of $CuSO_4$ is

$\left(Mw = 159.5gmol^{-1}\right)$

A. $1/8$

B. $1/4$

C. ½

D. 1

Answer: D

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59. Direct titration of I_2 with a reducing agent is called iodimetry. If I_2 is leberated by the oxidation of $I_{\ominus}$ ion by a strong oxidising agent in neutral or acidic medium, the liberated I_2 is then titrated with reducing agent. Iodometry is used to estimate the strngth of the oxidising agent. For example, in the estimation of Cu^{2+} with $S_2O_3^{2-}$

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$2CuSO_4 + 4KI \rightarrow Cu_2I_2 + 2K_2SO_4 + I_2$

The equivalent weight of $CuSO_4$ is

$\left(Mw = 159.5gmol^{-1}\right)$

A. 10 %

B. 20 %

C. 5 %

D. 30 %

Answer: A

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60. Iodine titrations: Compounds containing iodine are widely used in titrations, commonly known as iodine titration. It is of two kinds:

(i) Iodometric titrations

(ii) Iodimetric titrations.

(i) Iodometric titrations: It is nothing but an indirect method of estimating the iodine. In this type of titration, an oxidising

agent is made to react with excess of KI, in acidix medium or , basic medium in which I^- oxidises into I_2. Now the liberated I_2 can be titrated with $Na_2S_2O_3$ solution.

$$KI \xrightarrow{\text{Oxidising Agent}} I_2 \xrightarrow{Na_2S_2O_3/H^+} I^- + Na_2S_4O_6$$

Although solid I_2 is black and insoluble in water, but it converts into soluble I_3 ions

$$\underset{\text{Black}}{I_2(s)} + I^- \Leftrightarrow \underset{\text{dark brown}}{I_3^-}$$

Strach is used as indicator near the end point or equivalence point. Even small amount of I_2 molecules, gives blue colour with strach. The completion of the reaction can be detected when blue colour disappears at the and point. In iodimetric titration, the strength of reducing agent is determined by reacting it with I_2.

When $79.75g$ of $CuSO_4$ sample containing inert impurity is reacted with KI, the liberated I_2 is reacted with $50mL(1M)Na_2S_2O_3$ in basic medium, where it oxidises into SO_4

ions, and I_2 reduces into I^-, then what will be the % purity of $CuSO_4$ in sample?

A. 60 %

B. 80 %

C. 50 %

D. 95 %

Answer: B

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61. Iodine titrations: Compounds containing iodine are widely used in titrations, commonly known as iodine titration. It is of two kinds:

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(i) Iodometric titrations: It is nothing but an indirect method of estimating the iodine. In this type of titration, an oxidising agent is made to react with excess of KI, in acidix medium or , basic medium in which I^- oxidises into I_2. Now the liberated I_2 can be titrated with $Na_2S_2O_3$ solution.

$$KI \xrightarrow{\text{Oxidising Agent}} I_2 \xrightarrow{Na_2S_2O_3/H^+} I^- + Na_2S_4O_6$$

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$$\underset{\text{Black}}{I_2(s)} + I^- \Leftrightarrow \underset{\text{dark brown}}{I_3^-}$$

Strach is used as indicator near the end point or equivalence point. Even small amount of I_2 molecules, gives blue colour with strach. The completion of the reaction can be detected when blue colour disappears at the and point. In iodimetric titration, the strength of reducing agent is determined by reacting it with I_2.

When $214g$ of KIO_3 reacts with excess of KI in presence of H^+,

then it produces I_2. Now I_2 is completely reacted with $1MNa_2S_2O_3$ solution in basic medium, where it converts into SO_4^{-2} ions. then what volume of $Na_2S_2O_3$ is needed to react the end point of the reaction?

A. 500ml

B. 800ml

C. 1500ml

D. 750ml

Answer: D

View Text Solution

62. Iodine titrations: Compounds containing iodine are widely used in titrations, commonly known as iodine titration. It is of

two kinds:

(i) Iodometric titrations

(ii) Iodimetric titrations.

(i) Iodometric titrations: It is nothing but an indirect method of estimating the iodine. In this type of titration, an oxidising agent is made to react with excess of KI, in acidix medium or , basic medium in which I^- oxidises into I_2. Now the liberated I_2 can be titrated with $Na_2S_2O_3$ solution.

$$KI \xrightarrow{\text{Oxidising Agent}} I_2 \xrightarrow{Na_2S_2O_3/H^+} I^- + Na_2S_4O_6$$

Although solid I_2 is black and insoluble in water, but it converts into soluble I_3 ions

$$\underset{\text{Black}}{I_2(s)} + I^- \Leftrightarrow \underset{\text{dark brown}}{I_3^-}$$

Strach is used as indicator near the end point or equivalence point. Even small amount of I_2 molecules, gives blue colour with strach. The completion of the reaction can be detected when blue colour disappears at the and point. In iodimetric titration, the strength of reducing agent is determined by

reacting it with I_2.

A solution containing Cu^{+2} and $C_2O_4^{-2}$ ions M which on titration with $M/10KMnO_4$ requires $50mL$. The resulting solution is neutralized with K_2CO_3, then treated with excess of KI. M The liberated I_2 required $25mLM/10Na_2S_2O_3$ in acidic solution, then what is the difference of the number of m mole of Cu^{+2} and $C_2O_4^{-2}$ ions in the solution?

A. 40

B. 10

C. 30

D. 50

Answer: B

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63. To a 25 ml H_2O_2 solution, excess of acidified solution of Kl was added. The iodine liberated required 20 ml of 0.3 N $Na_2S_2O_3$ solution.

The volme strength of H_2O_2 solution is

A. $11.2ml$

B. $37.2ml$

C. $5.6ml$

D. $22.4ml$

Answer: C

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64. $25mL$ of H_2O_2 solution were added to excess of acidified solution of KI. The iodine so liberated required $20mL$ of

$0.1NNa_2S_2O_3$ for titration Calculate the strength of H_2O_2 in terms of normalility, percentage and volumes.

(b) To a $25mLH_2O_2$ solution, excess of acidified solution of KI was added. The iodine liberated required $20mL$ of $0.3N$ sodium thiosulphate solution. Calculate the volume strength of H_2O_2 solution.

A. $3.6g$

B. $0.8g$

C. $4.2g$

D. $0.98g$

Answer: D

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65. To a 25 ml H_2O_2 solution, excess of acidified solution of Kl was added. The iodine liberated required 20 ml of 0.3 N $Na_2S_2O_3$ solution.

The volme strength of H_2O_2 solution is

A. 56ml

B. 112ml

C. 168ml

D. 224ml

Answer: B

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66. Match the following columns

Column – I (Reaction)	Column – II (Eq wt)
A) $NH_3 \longrightarrow NO_3^-$	p) M/3
B) $FeC_2O_4 \longrightarrow Fe^{3+} + 2CO_3^{2-}$	q) M/6
C) $H_2SO_5 \longrightarrow S_8$	r) M/8
D) $KMnO_4 \longrightarrow Mn^{2+}$	s) M/5
	(t) reducing agent

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67. Match the following columns

Column – I (Acid)	Column – II (Nature)
A) H_3PO_4	p) Monobasic
B) H_3PO_3	q) Protonic acid
C) H_3BO_3	r) Tri basic
D) EDTA	s) Tetra basic
	t) Dibasic

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68. Match the following columns

Column – I	Column – II
A) $KMnO_4 \xrightarrow{H^+} Mn^{+2}$	p) M/2
B) $MgC_2O_4 \longrightarrow Mg^{2+} + CO_2$	q) M/5
C) $K_2Cr_2O_7 \longrightarrow Cr^{+3}$	r) M/6
D) $CrO_5 \longrightarrow Cr_2O_3$	s) M/3
	t) Oxidising agent

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69. Match the following columns

Column - I

A) Equivalent w.t $= \frac{Mol.w.t}{33}$

B) Equivalent w.t $= \frac{Mol.w.t}{27}$

C) Equivalent w.t $= \frac{Mol.w.t}{28}$

D) Equivalent w.t $= \frac{Mol.w.t}{24}$

Column - II

p) When CrI_3 oxidies into $Cr_2O_7^{2-}$ and IO_4^-

q) When $Fe(SCN)_2$ oxidies in to

$Fe^{+3}, SO_4^{-2}, CO_3^{2-}$ and NO_3^-

r) When NH_4SCN oxidies into

$SO_4^{-2}, CO_3^{-2}, NO_3^-$

s) When As_2S_3 oxidies into AsO_4^{3-} and SO_4^{-2}

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70. Match the following

Column - I

A) 120g urea in 1lt solution $(d_{solution} = 1.2g/ml)$

B) 126g HNO_3 + 1.08 lit H_2O $(d_{H_2O} = 1g/ml)$

C) 98g H_2SO_4 in 500mL solution
$(d_{solution} = 1.276g/ml)$

D) 60g CH_3COOH in 500ml solution
$(d_{solution} = 1.2g/ml)$

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71.

A) 1.1g H_2SO_3 B) 4.9g H_3PO_4

C) 4.5g oxalic acid D) 5.3g Na_2CO_3

Colum - II

p) 200ml of 0.5N base is used for comple neutralization

q) 200 milli moles of oxygen atoms

r) Central atom has its highest oxidation number

s) May react with an oxidising agent

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72. $10mL$ of a mixture of CO, CH_4, and N_2 exploded with excess of oxygen gave a contraction of $6.5mL$. There was a further contraction of $7mL$, when the residual gas treated with KOH. What is the composition of the original mixture?

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73. A mixture $NaOH + Na_2CO_3$ required 25mL of 0.1 M HCl using phenolpththalein as the indicator. However, the same amount of the mixture required 30mL of 0.1M HCl when methyl orange was used as the indicator. The molar ration of $NaOH$ and Na_2CO_3 in the mixture was:

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74. A^{n+1} is maximum oxidised by acidified $KMnO_4$ solution into AO_3^-. If 2.68 m moles of $A^{+(n+1)}$ requires $32.16mL$ of a $0.05M$ acidified $KMnO_4$ solution for complete oxidation,value of n is

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75. 2 mole , equimplar mixture of $Na_2C_2O_4$ and $H_2C_2O_4$ required $V_1 Lof 0.1M KMnO_4$ in acidic medium for complete oxidation. The same amount of the mixture required $V_2 Lof 0.2M NaOH$ for neutralisaation. The raation of V_1 and V_2 is:

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76. 1 mole of equimolar mixture of $Fe_2\left(C_2O_4\right)_3$ and FeC_2O_4 required X moles of $KMnO_4$ in acid medium for complete reaction. The value of X is:

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77. 2.68×10^{-3} moles of solution containing anion A^{n+} require 1.61×10^{-3} moles of MnO_4^- for oxidation of A^{n+} to AO_3^- in acidic medium. What is the value of n?

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78. 1.575 g of oxalic acid $(COOH)_2.xH_2O$ are dissolved in water and the volume made up to 250 mL. On titration 16.68 mL of

this soltuion requires 25 mL of $\frac{N}{15}NaOH$ solution for complete neutralisation. Calculate x.

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79. 1 " mol of "$IO_3^{\ominus}$ ions is heated with excess of $I^{\ominus}$ ions in the presence of acidic conditions as per the following equation

$IO_3^{\ominus} + I^{\ominus} \rightarrow I_2$

How many moles of acidified bypo solution will be required to react completely with I_2 thus produced?

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80. 1 L $\frac{M}{10}Ba\left(MnO_4\right)_2$ in acidic medium can be oxidised completely with $\frac{1}{6}$ L of x M ferric oxalate. The volume of x is

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81. The formula weight of an acid is $82.0.100cm^3$ of a solution of this acid containing $39.0g$ of the acid per litre were completely neutralised by $95.0cm^3$ of aqueous $NaOH$ containing $40.0g$ of $NaOH$ per litre. What is the basicity of the acid?

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LEVEL-VI

1. The equilibrium constant of the following redox rection at 298 K is 1×10^8

$2Fe^{3+}(aq.) + 2I^{-}(aq.) \Leftrightarrow 2Fe^{2+}(aq.) + I_2(s)$

If the standard reducing potential of iodine becoming iodide is

+0.54 V. what is the standard reduction potential of Fe^{3+}/Fe^{2+} ?

A. 64.2

B. 51.0

C. 48.4

D. 25.5

Answer: B

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2. A sample of $FeSO_4$ and FeC_2O_4 is dissolved in H_2SO_4 . The complete oxidation of sample required 8/3 eq. of $KMnO_4$. After oxidation , the reaction mixture was reduced by Z. On again

oxidation by $KMnO_4$ required $\frac{5}{3}$ eq. The mole ratio of $FeSO_4$ and FeC_2O_4 is

A. $3:7$

B. $2:3$

C. $7:3$

D. $3:5$

Answer: C

Watch Video Solution

3. One gram of Na_3AsO_4 is boiled with excess of solid KI in presence of strong HCl. The iodine evolved is absorbed in KI solution and titrated against $0.2N$ hyposolution. Assuming the reaction to be

$AsO_4^{3-} + 2H^+ + 2I^- \rightarrow AsO_3^{2-} + H_2O + I_2$,

calculate the volume of arsenate consumed. [Atomic weight of $As = 75$]

A. $48.1ml$

B. $38.4ml$

C. $24.7ml$

D. $30.3ml$

Answer: A

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4. $4.9g$ of $K_2Cr_2O_7$ is taken to prepare $0.1L$ of the solutio. $10mL$ of this solution is further taken to oxidise Sn^{2+} ion into $Sn^{4+}ion$ so produced is used in second reaction to prepare

Fe^{3+} ion then the millimoles of Fe^{3+} ion formed will be (assume all other components are in sufficient amount)[Molar mass of $K_2Cr_2O_7 = 294g$].

A. 5

B. 20

C. 10

D. 15

Answer: C

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5. F_2 can be prepared by reacting hexfluoro magnante (IV) with antimony pentafluoride as:

$K_2KnF_6 + SbF_5 \xrightarrow{150^\circ C} KSbF_6 + MnF_3 + F_2$ ltBrgt The number of

equivalent of K_2MnF_6 requried to react completely with one " mol of "SbF_5 in the given reaction is

A. 1.52

B. 5.0

C. 0.5

D. 4.0

Answer: C

Watch Video Solution

6. Certain " mol of "HCN is oxidised completely by 25 " mL of " $KMnO_4$. The products are CO_2 and $NO_3^{\ominus}$ ion. When all CO_2 is passed through lime water , 1 g of $CaCO_3$ is obtained the molarity of the $KMnO_4$ used is

A. $1.44M$

B. $0.72M$

C. $0.36M$

D. $0.8M$

Answer: D

Watch Video Solution

7. If $10g$ of V_2O_5 is dissolved in acid and is reduced to V^{2+} by zinc metal, how many mole I_2 could be reduced by the resulting solution if it is further oxidised to VO^{2+} ions? [Assume no change in state of Zn^{2+} ions] ($V = 51$, $O = 16$, $I = 127$)

A. 0.11mol of I_2

B. 0.22 mol of I_2

C. 0.055 ml of I_2

D. 0.44 ml of I_2

Answer: A

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8. H_2O_2 reduces $K_4Fe(CN)_6$

A. 6.1

B. 12.2

C. 3.0

D. 5.0

Answer: A

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9. Comprehension # 6

The percentage labelling of oleum is a unique process by means of which, the percentage composition of H_2SO_4, SO_3 (free) and SO_3 (combined) is calculated.

Oleum is nothing but it is a mixture of H_2SO_4 and SO_3 i.e., $H_2S_2O_7$, which is obtained by passing. SO_3 in solution of H_2SO_4. In order of dissolve free SO_3 in oleum, dilution of oleum is done, in which oleum converts into pure H_2SO_4. It is shown by the reaction as under :

$H_2SO_4 + SO_3 + H_2O \rightarrow 2H_2SO_4(\text{pure})$

or " "$SO_3 + H_2O \rightarrow H_2SO_4(\text{pure})$

When $100g$ sample of oleum is diluted with desired weight of $H_2O(\text{in}g)$, then the total mass of pure H_2SO_4 obtained after dilution is known as percentage labelling in oleum.

For example, if the oleum sample is labelled as $109\ \%\ H_2SO_4$ it means that $100g$ of oleum on dilution with $9m$ of H_2O provides $109g$ pure H_2SO_4, in which all free SO_2 in $100g$ of oleum is dissolved.

For $109\ \%$ labelled oleum if the number of moles of H_2SO_4 and free SO_3 be x and y respectively, then what will be the value of $\frac{x+y}{x-y}$?

A. 1.1

B. 5

C. 0.5

D. 10.1

Answer: D

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10. H_2O_2 acts as both oxidising and reducing agent. As oxidising agent, its product is H_2O but as redusing agent, its product is O_2. Volume strength has great significance for chemical reactions. The strength of '10 V means 1 volume (or litre) of H_2O_2 on decomposition $\left(H_2O_2 \rightarrow H_2O + \frac{1}{2}O_2\right)$ gives 10 volumes (or litre) of oxygen at NTP.

$15gBa\left(MnO_4\right)_2$ sample containing inert impurity is completely reacting with 100 mL of '11.2 V' H_2O_2, then what will be the $\%$ purity of $Ba\left(MnO_4\right)_2$ in the sample: (Atomic mass: $Ba = 137, Mn = 55$)

A. 50 %

B. 40 %

C. 68 %

D. 25 %

Answer: C

Watch Video Solution

11. A $100ml$ solution of $0.1NHCl$ was titrated with $0.2?$ $NNaOH$ solution. The titration. The remaining titration war completed by adding $0.25NKOH$ solution. The volume of KOH required for completing the titration is

A. 16mL

B. 32 mL

C. 25 mL

D. 8mL

Answer: A

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12. $10g$ mixture of $NaHCO_3$ and Na_2CO_3 has $1.68gNaHCO_3$.

It is heated at $400K$. Weight of the residue will be

A. $10\ \%$

B. $19.6\ \%$

C. $50\ \%$

D. $60\ \%$

Answer: B

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13. A solution of H_2O_2 labelled as '20 V' was left open. Due to this some, H_2O_2 decomposed and volume strength of the

solution decreased . To determine the new volume strength of the H_2O_2 solution, 10 mL of the solution was taken and it was diluted to 100 mL . 10 mL of this diluted solution was titrated against 25 mL of 0.0245 M $KMnO_4$ solution under acidic condition. Calculate the volume strength of the H_2O_2 solution .

A. $10V$

B. $5V$

C. $14V$

D. $7V$

Answer: C

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14. A $2.0g$ sample of a mixture containing sodium carbonate, sodium bicarbonate and sodium sulphate is gently heated till the evolution of CO_2 ceases. The volume of CO_2 at $750mmHg$ pressure and at $298K$ is measured to be $123.9mL$. A $1.5g$ of the same sample requires $150mL$ of $(M/10)HCl$ for complete neutralisation. Calculate the percentage composition of the components of the mixture.

A. $10\ \%$

B. $71\ \%$

C. $31.5\ \%$

D. $50\ \%$

Answer: C

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15. 1 g of a sample of NaOH was dissolved in 50 " mL of " 0.33 M alkaline solution of $KMnO_4$ and refluxed till all the cyanide was converted into $OCN^{\ominus}$. The reaction mixture was cooled and its 5 mL portion was acidified by adding H_2SO_4 in excess and then titrated to end point against 19.0 " mL of " 0.1 M $FeSO_4$ solution. The percentage purity of NaCN sample is

A. 55.95 %

B. 65.95 %

C. 75.95 %

D. 85.95 %

Answer: C

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16. An aqueous solution containing 0.10 g KIO_3 (formula weight $= 214.0$) was treated with an excess of KI solution the solution was acidified with HCl. The liberated I_2 consumed 45.0 " mL of " thiosulphate solution to decolourise the blue starch-iodine complex. Calculate the molarity of the sodium thosulphate solution.

A. 0.0623

B. 6.23

C. 3.001

D. 1.23

Answer: A

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17. An acid solution of 0.2 " mol of "$KReO_4$ was reduced with Zn and then titrated with 1.6 " Eq of "acidic $KMnO_4$ solution for the reoxidation of the ehenium (Re) to the perrhenate ion $\left(ReO_4^{\ominus}\right)$. Assuming that rhenium was the only elements reduced, what is the oxidation state to which rhenium was reduced by Zn?

A. 1

B. 2

C. -1

D. -2

Answer: C

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18. If an ore sample containing Mn, is treated with $50mL$ of $0.2750MNa_2C_2O_4$ and the unreacted $Na_2C_2O_4$ required $18.28mL$ of $0.1232MKMnO_4$ in acidic medium,then the number of moles of Mn in the ore is

A. 1.38×10^{-2}

B. 1.49×10^{-3}

C. 1.15×10^{-2}

D. 8.35×10^{-3}

Answer: D

Watch Video Solution

19. Potassium selenate is isomorphous with potassium sulphate and contains $50.0\ \%$ of Se. The atomic weight of Se is

a. 142, b. 71, c. 47.33, d. 284

A. Oxidation state of Se in the given compound is $+6$

B. Atomic weight of Se is 118.6

C. Equivalent weight of potassium selenate is 130.3

D. All the above

Answer: D

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20. The molecular mass of an organic acid was determined by the study of its barium salt. $4.290g$ of salt was quantitiatively

converted to free acid by the reaction with $21.64ml$ of $0.477MH_2SO_4$. The barium salt was found to have two moles of water of hydration per Ba^{+2} ion and the acid is mono basic. what is molecular weight of anhydrous acid.

A. 137.32

B. 415.7

C. 242.4

D. 244.4

Answer: D

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21. A mixture containing As_2O_3 and As_2O_5 required $20.10mL$ of $0.02N$ iodine for titration. The resulting solution is then

acidified and excess of KI was added. The liberated iodine required $1.113g$hypo $\left(Na_2S_2O_3, 5H_2O\right)$ for complete reaction. Calculate madd of the mixture. The reactions are:

$$As_2O_3 + 2I_2 + 2H_2O \rightarrow As_{\circ}O_5 + 4H^+ + 4I^-$$

$$As_2O_5 + 4H^+ + 4I^- \rightarrow As_2O_3 + 2I_2 + 2H_2O$$

A. $0.2496g$

B. $0.0497g$

C. $0.1997g$

D. $0.5g$

Answer: A

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22. In a quality control analysis for sulphur impurity $0.56g$ steel sample was burnt in a stream of oxygen and sulpphur was converted into SO_2 gas. The SO_2 was then oxidized to sulphate by using H_2O_2 solution to which had been added $30mL$ of $0.04MNaOH$. the equation for reaction is:

$$SO_{2(g)} + H_2O_{2(aq)} + 2OH^-_{(aq)} \rightarrow SO^{-2}_{4(aq)} + 2H_2O_{(1)}$$

$22.48mL$ of $0.024MHCI$ was required to neutralize the base remaining after oxidation reaction. Calculate % of sulphur in given sample.

A. $3.6\ \%$

B. $1.875\ \%$

C. $9\ \%$

D. $4.5\ \%$

Answer: B

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23. A granulated sample of aircraft alloy (Al, Mg, Cu) weighing $8.72g$ was first treated with alkali and then with very dilute HCl, leaving a residue. The residue after alkali boiling weighed $2.10g$ and the acid insoluble residue weighed $0.69g$. What is the composition of the alloy?

A. Weight % of $AI = 75.9\ \%$

B. Weigth % of $Cu = 7.9\ \%$

C. Weight % of $Mg = 16.2\ \%$

D. All the above

Answer: D

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24. To a 10mL, 1M aqueous solution of Br_2, excess of NaOH is added so that all Br_2 is disproportionated to Br^- and BrO_3^-. The resulting solution is free from Br^-, by extraction and excess of OH^- neutralised by acidifying the solution. The resulting solution is suffcient to react with 2 g of impure CaC_2O_4(M= 128g/mol) sample. The % purity of oxalate sample is :

A. 85.3 %

B. 42.6 %

C. 63.75 %

D. 21.3 %

Answer: A

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25. When V ml of $2.2MH_2SO_4$ solution is mixed with 10 V ml of water, the volume contraction of 2% take place. Calculate the molarity of diluted solution ?

A. $0.2M$

B. $0.204M$

C. $0.196M$

D. $0.224M$

Answer: B

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26. A solution of $0.2g$ of a compound containing Cu^{2+} and $C_2O_4^{2-}$ ions on titration with $0.02MKMnO_4$ in presence of

H_2SO_4 consumes $22.6mL$ oxidant. The resulting solution is neutralized by Na_2CO_3, acidified with dilute CH_3COOH and titrated with excess of KI. The liberated I_2 required $11.3mL of 0.05M Na_2S_2O_3$ for complete reduction. Find out mole ratio of Cu^{2+} and $C_2O_4^{2+}$ in compound.

A. The difference of the number of m mol of Cu^{2+} and $C_2O_4^{2-}$ ions in the solution is 10m mol

B. The difference of the number of m mol of Cu^{2+} and $C_2O_4^{2-}$ ions in the solution is 25.5 m mol

C. The equivalent weight of Cu^{2+} ions in the titration with KI is equal to the atomic weight of Cu^{2+}

D. The equivalent weight of KI in the titration is $M/2$ (M = Molecular weight to of KI)

Answer: A::C

Watch Video Solution

27. Silver metal in ore is dissolved by potassium cyanide solution in the presence of air by the reaction

$$4Ag + 8KCN + O_2 + 2H_2O \rightarrow 4K\left[Ag(CN)_2\right] + 4KOH$$

A. The amount of KCN required to dissolve 100g of pure Ag is 120g

B. The amount of oxygen used in this process is $0.742g$

C. The mount of oxygen used in this process is $7.40g$

D. The volume of oxygen used at STP is 5.20 lit.

Answer: A::C::D

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28. The density of 3M sodium thiosulphate is $1.25 g/mL$, identify the correct statements among the following:

A. % by weight of sodium thiosulphate is 37.92

B. The mole fraction of sodium thiosulphate is 0.065

C. The molarity of Na^+ is 2.53 and $S_2O_3^{2-}$ is 1.25

D. All of these

Answer: A::B

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29. 100 mL of 0.06 M $Ca\left(NO_3\right)_2$ is added to 50 mL of 0.06 M $Na_2C_2O_4$. After the reaction is complete.

A. 0.003 moles of calcium oxalate will get precipitated.

B. $0.003M$ of excess of Ca^{2+} will remain in excess

C. $Na_2C_2O_4$ is limiting agent

D. $Ca\left(NO_3\right)_2$ is excess reagent

Answer: A::C::D

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30. Which of the following samples of reducing agents is /are chemically equivalent to 25mL of 0.2 N $KMnO_4$ to be reduced to Mn^{2+} and water?

A. 25 ml of $0.2MFeSO_4$ to be oxidised to Fe^{3+}

B. 50ml of $0.1MH_3AsO_3$ to be oxidised to H_3AsO_4

C. 25 ml of $0.1MSO_3^{2-}$ to be oxidised to SO_4^{2-}

D. 25 ml of $0.1MSnCl_2$ to be oxidised to $SnCl_4$

Answer: A::C::D

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31. 20 " mL of " H_2O_2 is reacted completely with acidified $K_2Cr_2O_7$ solution 40 " mL of " $K_2Cr_3O_7$ solution was required to oxidised the H_2O_2 completely. Also, 2.0 " mL of " the same $K_2Cr_2O_7$ solution required 5.0 " mL of " a 1.0 M $H_2C_2O_4$ solution to reach equivalence point. Which of the following statements is/are correct?

A. The H_2O_2 solution is 5M

B. The volume strength of H_2O_2 is 56V

C. The volume strength of H_2O_2 is 112V

D. If 40 mL of $5/8 H_2O_2$ is further added to the 10mL of above H_2O_2 solution the volume strength of the resulting solution is changed to 16.8V

Answer: A::B::D

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32. A sample of a mixture of $CaCl_2$ and NaCl weighing 4.44 gm was treated to precipatate all the Ca as $CaCo_3$, which was then heated and quantitatively converted to 1.24 g of CaO. Choose the correct statements.

(Atomic weight :Ca=40=23, Cl =35.5)

A. Mixture contains $50\ \%\ NaCI$

B. Mixture contains $60\ \%\ CaCI_2$

C. Mass of $CaCI_2$ is 2.22g

D. Mass of $CaCI_2 1.11g$

Answer: A::C

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33. If $100mL of 1MH_2SO_4$ solution is mixed with $100mL$ of 98% (W/W) of H_2SO_4 solution $\left(d = 0.1gmL^{-1}\right)$, then

A. concentration of solution remains same

B. Volume of solution becomes 200ml

C. mass of H_2SO_4 in the solution is 98gm

D. mass of H_2SO_4 in the solution is 19.6gm

Answer: A::B::D

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34. Which of the following will produce a buffer sollution when mixed in equal volumes ?

A. $Co(g)$ and $O_2(g)$ taken in molar ratio 2:1

B. 10 ml of $CH_4(g)$ and $30ml$ of $O_2(g)$

C. $N_2(g)$ and $H_2(g)$ taken in a molar ratio 3:1

D. $CH_4(g)$ and $O_2(g)$ taken in a molar ratio 1:6

Answer: A::B

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35. The species which undergo disproportionation in alkaline medium is/ are

A. $(CN)_2$

B. S_8

C. NO_2

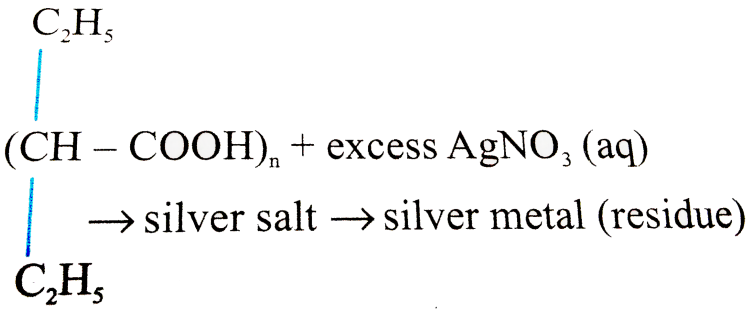
D. P_4

Answer: A::B::C::D

Watch Video Solution

A) $(CN)_2$ B) S_8 C) NO_2 D) P_4

36.



If 216g residue is obtained from 0.5 ml silver salt,

A. $n = 4$

B. $n = 2$

C. Molar mass of salt $= 718 g/mol$

D. Molar of mass of sat $= 388 gmol$

Answer: B::C

View Text Solution

37. When Br_2 is mixed with phosphorous, first PBr_3 is formed till all phosporous has reacted. If Br_2 still remains, PBr_5 is formed as far as possible. If equal masses of Br_2 and P are mixed, which of the following will surely remain in the reaction mixture

A. P

B. PBr_2

C. PBr_5

D. Br_2

Answer: A::B

View Text Solution

38. A $3.0g$ sample containing Fe_3O_4, Fe_2O_3 and an inert impure substance is treated with excess of KI solution in presence of dilute H_2SO_4. The entire iron is converted to Fe^{2+} along with the liberation of iodine. The resulting solution is diluted to $100mL$. A $20mL$ of dilute solution requires $11.0mL$ of $0.5MNa_2S_2O_3$ solution to reduce the iodine present. A $50mL$ of the diluted solution, after complete extraction of iodine requires $12.80mL$ of $0.25MKMnO_4$ solution in dilute H_2SO_4 medium for the oxidation of Fe^{2+}. Calculate the percentage of Fe_2O_3 and Fe_3O_4 in the original sample.

A. $\%\, Fe_2O_3 = 40$

B. $\%\, FeO = 28$

C. % of inert impurity $= 42\,\%$

D. % Inert impurity $= 32$

Answer: A::C

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39. The ion A^{n+} is oxidised to AO_3^- by MnO_4^- changing to Mn^{2+} in acid medium. Given that 2.68×10^{-3} mole of A^{n+} required 1.61×10^{-3} mole of MnO_4^- . What is the value of n.

A. $n = 2$

B. Empirical formula of the oxide is AO

C. 1 mole of A_2O_n would require 1 mole of $K_2Cr_2O_7$ in acidic medium

D. A' can be a IIA group metal

Answer: A::B::C

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40. Atomic weight of an element X is 120 when one amu is defined as $1/18th$ part by weight of an element of C^{12}. On the same scale, atomic weight of another element Y is 72. Which of the following statement regarding X and is (are) correct?

a. On conventional scale, atomic weight of X is 80

b. On conventional scale, atomic weight of Y is 108

c. On a scale when an amu is defined to be $1/30th$ of the weight of an atom of C^{12}, atom of C^{12}, atomic weight of X 200

d.On a scale when an amu is defined to be $1/15th$ of the weight of an atom of C^{12}, atomic weight of Y is 90

A. on convertional scale, atomic weight of X is 80

B. on convertional scale, atomic weight of Y is 108

C. On a scale when one 'U' is defined as $\frac{1}{30}th$ of the weight of an atom of C-12, atomic weight of X is 200

D. On a scale when one 'U' is defined as $\frac{1}{15}th$ of the weight of an atom of C-12, atomic weight of Y is 90

Answer: B::C

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41. Consider the following reaction:

$\left(CN_2\right) \rightarrow CN^- + CNO^-$ The correct statement(s) is/are about the reaction

A. It is disproportionation

B. Oxidation state of carbon charges from $+3$ to $+2$ and $+4$

C. Oxidation state of nitrogen doesnot charge

D. It is auto redox reaction

Answer: A::B::C::D

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42. Name the substance oxidised, reduced, oxidising agent and reducing agent in the following reaction :

$Zn(s) + FeSO_4(aq) \rightarrow ZnSO_4(aq) + Fe(s)$

A. $K_2Cr_2O_7$ in presence of dil H_2SO_4

B. $K_2Cr_2O_7$ in presence of dil HCl

C. $KMnO_4$ in presence of dil HCl

D. $KMnO_4$ in presence of dil H_2SO_4

Answer: C

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43. The more positive the value of E^{θ}, the greater is the trendency of the species to get reduced. Using the standard electrode potential of redox coples given below find out which of the following is the strongest oxidising agent.

E^{θ} values: $Fe^{3+}/Fe^{2+} = +0.77$

$I_2(s)/I^- = +0.54,$

$Cu^{2+}/Cu = +0.34, Ag^+/A = 0.80V$

A. 10 millimol

B. 30 millimoles

C. 20 millimoles

D. Quanitative estimation cant be made from given data

Answer: A

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44. In qualitative estimation of any element using an oxidising agent is essential to predict which substance (s) gets oxidised by the oxidising agent. In case more than one substance is getting oxidised then the oxidising agent gets distributed in all the reactions taking place. From this information and the data given below answer the following questions:

$Fe^{2+} \rightarrow Fe^{3+} + e^{-}$

$E^{\circ} = -0.77V$

$MnO_4^{-} + 5e^{-} \rightarrow Mn^{2+} + 4H_2O$

$E^{\circ} = +1.51V$

$2Cl^{-} \rightarrow Cl_2 + 2e^{-}$

$E^{\circ} = -1.36V$

$2SO_4^{2-} \rightarrow S_2O_8^{2-} + 2e^-$

$E^\circ = -2.0V$

$C_2O_4^{2-} \rightarrow 2CO_2 + 2e^-$

$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$

$E^\circ = +1.33$ volt

Millimol of FeC_2O_4 in the solution if 50ml of $0.1MKMnO_4$ is used for its oxidation in presence dilute HCl if 3.5 millimoles of Cl_2 is obtained along with other products.

A. $\frac{25}{3}$ m. mol

B. 6m. Mol

C. 12.5 m mol

D. Quanitative estimation can be made from the give data

Answer: B

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45. Quantity of 1.5g brass containing Cu,Zn reacts with $3M, HNO_3$ solution, the following reactions takes place

$Cu + HNO_3 \rightarrow Cu^{2+} + NO_2 + H_2O$

$Zn + H^+ + NO_3^- \rightarrow NH_4^+ + ZN^{2+} + H_2O$ (un balanced)

The liberated $NO_2(g)$ is found to occupy 1.04 litre at $25\,^\circ C$ and 1 atm pressure. Now answer the following question

% of copper in the alloy is

A. 80

B. 90

C. 85

D. 10

Answer: B

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46. Quantity of 1.5g brass containing Cu,Zn reacts with $3M, HNO_3$ solution, the following reactions takes place

$Cu + HNO_3 \rightarrow Cu^{2+} + NO_2 + H_2O$

$Zn + H^+ + NO_3^- \rightarrow NH_4^+ + ZN^{2+} + H_2O$ (un balanced)

The liberated $NO_2(g)$ is found to occupy 1.04 litre at $25\,^\circ C$ and 1 atm pressure. Now answer the following question

% of copper in the alloy is

A. 9.56

B. 14.34

C. 6.37

D. 19.12

Answer: B

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47. Quantity of 1.5g brass containing Cu,Zn reacts with $3M, HNO_3$ solution, the following reactions takes place

$Cu + HNO_3 \rightarrow Cu^{2+} + NO_2 + H_2O$

$Zn + H^+ + NO_3^- \rightarrow NH_4^+ + ZN^{2+} + H_2O$ (un balanced)

The liberated $NO_2(g)$ is found to occupy 1.04 litre at $25^\circ C$ and 1 atm pressure. Now answer the following question

Weight of NH_4NO_3 formed in the reaction is

A. $0.046g$

B. $0.183g$

C. $0.092g$

D. $0.55g$

Answer: A

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48. $2.616g$ of an element (X) is heated with excess of $NaNO_3$ and $NaOH$ to produce a basic gas (Y) and Na_2XO_2. The basic gas liberated exactly requires 5×10^{-3} mol H_2SO_4 for complete neutralisation. If 4 mol of X are completely consumed by caustic soda, find the no of mole of H_2 gas liberated.

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49. When a solid element is reacted with Cl_2, a gaseous chloride of vapour density, 68.75 is formed. If this reaction is performed at constant temperature and pressure. The volume of the system is reduced by $1/3$. If $E =$ equivalent mass of element, the volume of $\frac{12}{31}XE$ is

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50. If one of the atoms in I are completely converted to get compound in II

List-I

a) 1 mol FeS_2

b) $\frac{1}{3}$ mol $K_3[Co(SCN)_6]$

c) $\frac{1}{3}$ mol $K_3[Co(NO_2)_6]$

d) $\frac{1}{2}$ mol $[NiP(C_2H_5)_3][Ni(CN)_4]$

List-II

p) $\frac{1}{2}$ mole $K_2Zn_3[Fe(CN)_6]_2$

q) 1 mol $[Ni(CO)_4]$

r) $\frac{1}{6}$ mol $K[(NH_3)_5(O-O-CO(CN)_5)]$

s) $\frac{1}{5}$ mol $Fe_3[Fe(CN)_6]_2$

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List-I

a) $P_2H_4 \rightarrow PH_3 + P_4H_2$

b) $I_2 \rightarrow I^- + IO_3^-$

c) $MnO_4^- + Mn^{2+} + H_2O \rightarrow Mn_3O_4 + H^+$

d) $H_3PO_2 \rightarrow PH_3 + H_3PO_3$

List-II

p) $E = \frac{3M}{4}$

q) $E = \frac{3M}{5}$

r) $E = \frac{1.5M}{2}$

s) $R = \frac{5M}{6}$

51.

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Others

1. Add 6.6510^4 and $8.95' 10^3$.

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2. Report tha answer to correct singificant figures in $2.5' 1.25$

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3. Two oxides of metal M have $27.6\,\%$ and $30\,\%$ oxygen by weight. If the formula of the first oxide is M_3O_4 what is the formula of second oxide?

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4. If dry air is considered to have only nitrogen and oxygen and is found to have average molecular mass 28.84. what is the composition of dry Air ?

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5. No . of gram atoms in 1kg of Helium

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6. No of gram atoms in 12.044×10^{23} Na atoms

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7. Mass of one hydrogen atom

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8. No of atoms in 4 gram of calcium

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9. No of molecules in 2.2 grams of Co_2

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10. The volume occupied by 35.5g of CI_2 at S.T.P.

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11. Calculate the no. of moles in 0.72 grams of glucose ?

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12. Calculate weight of 0.1 moles of Na_2CO_3?

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13. Calculate the number of moles in 5.6 lit of methane at STP ?

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14. Calculate weight of 3.011×10^{23} molecules of SO_2?

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15. Calculate the number of molecules in 1120 ml of hydrogen at STP?

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16. What is the ratio of number of molecules, if tha mass ratio of N_2 and O_2 is 4:1 ?

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17. Equivalent weight of sulphate ion and bicarbonate ion :

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18. $H_2SO_4 + NaOH \rightarrow NaHSO_4 + H_2O$ In this equation the equivalent weight of sulphuric acid is...

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19. $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ In this equation the equivalent weight of sulphuric acid is.....

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20. $Mg(OH)_2 + HCI \rightarrow Mg(OH)CI + H_2O$

In this reaction, the equivalent weight of $Mg(OH)_2$

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21. $Mg(OH)_2 + 2HCI \rightarrow MgCI_2 + 2H_2O$

In this reaction, the equivalent weight of $Mg(OH)_2$ is

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22. 1.0 g of a metal oxide gave 0.2 g of metal. Calculate the equivalent weight of the metal.

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23. $74.5g$ of a metallic chloride contain $35.5g$ of chlorine. The equivalent weight of the metal is

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24. 24 grams of metal reacts with an acid and liberated 22.4 lit of hydrogen at S.T.P. The eq.mass of metal is

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25. $1.520g$ of the hydroxide of a metal on ignition gave $0.995g$ of oxide. The equivalent weight of metal is

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26. On analysing an impure sample of sodium chloride, the percentage of chlorine was found to be 45.5. What is the percentage of pure sodium chloride in the sample ?

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27. An oxide of iron contains $69.94\,\%\,Fe$ and $30.06\,\%\,O$. Determine its E.F. ($Fe = 55.85$, $O = 16.0$)

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28. On analysis of a compund, it was found that it contains (i) 4.08 grams Na (ii) 0.264 mole oxygen atoms (ii) 5.3×10^{22} atoms of carbon. Determine its E.F.

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29. Calculate the M.F. of a hydrocarbon which caontains $85.7\ \%$ carbon and has molecular mass 84

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30. The weight of oxygen gas liberated by the heating of $2.45g$ of $KCIO_3$ is ____

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31. How many grams of $80\,\%$ pure marble stone on calination can give 14 grams of quick lime ?

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32. $50.0kg$ of $N_2(g)$ and $10.0kg$ of $H_2(g)$. Are mixed to produce $NH_3(g)$. The limiting reagent and amount of NH_3 formed are

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33. What volume of carbon monoxide at 2 atm and $273^\circ C$ is required in order to produce 5.6 grams of metal by the reduction of ferric oxide ?

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34. The volume of O_2 at S.T.P required for completely burnt out 100 ml. of ethane is

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35. Calculate the volume of air, containing 21% of oxygen by volume required for the complet combustion of 10L of ethylene under similar conditions

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36. What is the volume of ammonia obtained starting from 2L of nitrogen, if the conversion is only 6% efficient in the given conditions ?

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37. The volume of CO_2 liberated at S.T.P and the quantity of heat energy liberated from the combustion of 2.3 g of ethyl alcohol are

$C_2H_5OH(l) + 3O_2(g) \rightarrow$

$2CO_2(g) + 3H_2O(l) + 1367.2$

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38. Calcium carbonate reacts with aqueous HCI to give $CaCI_2$ and CO_2, write the reaction.

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39. What mass of $CaCO_3$ is required to react completely with 25 ml of $0.75MHCI$?

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40. Assigning of oxidation numbers in different compounds:

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41. What is the oxidation number of iron in the brown ring complex compound ?

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42. $xKI + yH_2SO_4 \rightarrow I_2 + SO_2 + KHSO_4$. In the above balanced equation, what are x & y ?

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43. Calculate the mole coefficient of H^+ in the balanced equation.

$$IO_3^- + I^- + H^+ \xrightarrow{OH^-} I_2 + H_2O.$$

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44. Reaction between hydrogen sulphide and sulphurdioxide gives sulphur. Which type of redox reaction is this ?

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45. 40 ml $N/10HCl$ and $60mlN/20KOH$ are mixed together. Calculate the normality of the acid or base left. The normality of the salt formed in the solution will be

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46. $NaOH$ and Na_2CO_3 are dissolvedin 200 ml aqueous solution. In the presence of phenolphthalein indicator. 17.5 ml of $0.1NHCl$ are used to titrate this solution. Now methyl orange is added in the same solution titrated and it requires 2.5ml of the same HCl. Calculate the normality of $NaOH$ and Na_2CO_3 and their mass present in the solution.

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47. $NaOH$ and Na_2CO_3 are dissolvedin 200 ml aqueous solution. In the presence of phenolphthalein indicator. 17.5 ml of $0.1NHCl$ are used to titrate this solution. Now methyl orange is added in the same solution titrated and it requires 2.5ml of the same HCl. Calculate the normality of $NaOH$ and Na_2CO_3 and their mass present in the solution.

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48. 20g of a sample of $Ba(OH)_2$ is dissolved in 10ml of $0.5NHCI$ solution. The excess of HCI was titrated with $0.2NNaOH$. The volume of NaOH used was 10 c c. Calculate the percentage of $Ba(OH)_2$ in the sample.

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49. A 0.5 g sample containing MnO_2 is treated with HCl liberating Cl_2 is passed into a solution of KI and 30.0 " mL of " 0.1 M $Na_2S_2O_3$ are required to titrate the liberated iodine. Calculate the percentage of MnO_2 is the sample.

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50. 100g of a water samples is found to contain 12 mg of $MgSO_4$ calculate the hardness of water sample.

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51. 1 litre water sample of ground water in an area is found to contain 7.3 mg of $Mg\left(HCO_3\right)$ and $1.11mg$ of $CaCl_2$. Express the hardness of water in that area.

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52. A sample of H_2O_2 is x% by mass x ml of $KMnO_4$ are required to oxidize one gram of this H_2O_2 sample. Calculate the normality of $KMnO_4$ solution.

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53. Calculate the composition of $109\ \%$ oleum

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