CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

STOICHIOMETRY

Lecture Sheet Straight Objective Type Questions

1. One mole of molecules of oxygen represents

A. 6.02×10^{23} molecules of oxygen

B. 8 gms of oxygen

C. 16 g of O_2

D. 11.2 L of O_2 at STP

Answer: A

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2. The ratio between the number of molecules in equal masses of nitrogen and oxygen is

A. $7:8$

B. $1:9$

C. $9:1$

D. $8:7$

Answer: D

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3. The atomic masses of two elements A and B are 20 and 40 respectively. If x gm of A contains Y atoms, how many atoms are present in 2x gm of B

A. 2y

B. y/2

C. y

D. 4y

Answer: C

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4. Total number of sulphate ions present in 3.92 g of chromic sulphate is (Cr=52, S=32, O=16)

A. 1.8×10^{22}

B. 1.8×10^{23}

C. 1.2×10^{21}

D. 6×10^{23}

Answer: A

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5. Analysis of chlorophyll shows that it contains 2.68% Mg. Number of magnesium atoms present in 2.4 g of chlorophyll is

A. $2.68 \times 6 \times 10^{21}$

B. $2.68 \times 6 \times 10^{23}$

C. $2.68 \times 6 \times 10^{20}$

D. $2.68 \times 6 \times 10^{20} / 24$

Answer: C

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6. The mass of water (in grams) in one mole of crystalline hypo is

A. 18

B. 90

C. 158

D. 248

Answer: B

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7. The empricial formula of a compound is CH_2O. Its molecular weight is 120. The molecular formula of the compound is

A. $C_3H_6O_3$

B. $C_4H_8O_4$

C. $C_2H_4O_2$

D. $C_6H_{12}O_6$

Answer: B

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8. 0.262 g of a substance gave, on combustion 0.361 g of CO_2 and 0.147 g of H_2O. What is the empirical formula of the substance

A. CH_2O

B. C_3H_6O

C. $C_3H_6O_2$

D. $C_2H_6O_2$

Answer: A

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9. 0.66 g of a compound gave 112 ml of nitrogen at STP in the Dumas method. The percentage of Nitrogen in the compound is

A. 25

B. 41.5

C. 42.4

D. 21.2

Answer: D

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10. A diabasic acid containing C,H and O was found to contain C=26.7% and H=2.2%. The vapour density of its dimethyl ester was found to bc 73. The molecular formula of the acid is

A. CH_2O_2

B. $C_2H_2O_4$

C. $C_3H_3O_4$

D. $C_2H_4O_4$

Answer: B

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11. A peroxidase enzyme contains 2% selenium(Se=80). The minimum molecular weight of the enzyme is

A. 1000

B. 2000

C. 4000

D. 800

Answer: C

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12. Carbon and oxygen combine to form two oxides, carbon monoxide and carbond dioxide in which the ratioi of the weights of carbon and oxygen is respectively 12:16 and 12:32. these figures illustrate the

A. Law of multiple proportions

B. Law of reciprical proportions

C. Law of conservation of mass

D. Law of constant proportions

Answer: A

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13. A chemical equation is always balanced with respect which one of the following

(i)Number of atoms (ii) Number of molecules

(iii) Number of moles (iv) Mass

A. Only I is correct

B. Only iii correct

C. Only iv correct

D. Both I and iv are correct

Answer: D

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14. Which of the following has highest mass?

A. One gram atom of Iron

B. 5 moles of N_2

C. 10^{24} carbon atoms

D. 44.8 lit of He at STP

Answer: B

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15. Which contains more number of molecules?

A. 1 mole of carbon dioxide

B. 4 g of hydrogen

C. 33.6 litres of oxygen at StP

D. 6g of helium

Answer: B

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16. Which of the following gases has the highest density under standard conditions?

A. CO

B. N_2O

C. C_3H_8

D. SO_2

Answer: B

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Lecture Sheet More Than One Correct Answer Type Questions

1. Which of the following contains Avagadro number of atoms?

A. one mole of Helium gas

B. 22.4 lits of CO_2 at STP

C. 11.2 lits of Hydrogen gas at STP

D. 3.2 gms of methane

Answer: A::C::D

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2. Equal masses of oxygen and ozone have equal

A. number of grammolecules

B. number of gramafoms

C. volumes at STP

D. number of electrons

Answer: B::D

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3. 0.5 mole of P_4IO_{10} contains

A. 80 gm oxygen

B. 2 gram atoms phosphorous

C. 5 gram atoms oxygen

D. 10 gram atoms oxygen

Answer: A::B::C

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Lecture Sheet Linked Comprehension Type Questions

1. A mole of any substance contains 6.023×10^{23} particles. The particles may be atom, molecule ions, electron, proton or neutron. One mole of atom is equal to 1 gm -atom which is equal to atomic weight of atom. 1 gm molecule of any gas is 1 mole of gas whose volume is 22.4 litre at N.T.P. The volume of 3.011×10^{23} atoms of hydrogen gas at N.T.P. is

A. 1.12 litres

B. 2.24 litres

C. 2.8 litres

D. 5.6 litres

Answer: D

2. A mole of any substance contains 6.023×10^{23} particles. The particles may be atom, molecule ions, electron, proton or neutron. One mole of atom is equal to 1 gm -atom which is equal to atomic weight of atom. 1

gm molecule of any gas is 1 mole of gas whose volume is 22.4 litre at N.T.P.

Mass of 1 atom of an element X_2 is $6.64 \times 10^{-23} gm$. Molecular weight of X_2 is

A. 80

B. 60

C. 40

D. 20

Answer: A

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3. 4.4 gms of a hydrocarbon on complete combustion produced 13.2 gms of CO_2 and 7.2 gms of H_2O.

What is the hydrocarbon?

A. Propane

B. Propene

C. Butane

D. Butene

Answer: A

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4. 4.4 gms of a hydrocarbon on complete combustion produced 13.2 gms of CO_2 and 7.2 gms of H_2O.

How many moles of oxygen is consumed per mole of hydrocarbon in the combustion?

A. 3

B. 5

C. 4

D. 6

Answer: B

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Lecture Sheet Matrix Matching Type Questions

1. Match the following columns

Column-I	Column-II
A) NH_3	P) EF = MF
B) N_2H_4	Q) MF = $(EF)_2$
C) N_1H	R) Maximum percentage of nitrogen by mass
D) C_2N_2	S) Least percentage of nitrogen by mass

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2. Match the following columns

Column-I	Column-II
A) 0.1 mole Benzene	P) 0.3 moles 'π' bond
B) 0.1 mole glucose	Q) 0.6 gram atoms of carbon
C) 0.6 mole CO_2	R) 0.3 gram molecules of O_2
D) 0.4 mole ethylene	S) 1.2 gram atoms of hydrogen

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Lecture Sheet Integer Type Questions

1. An enzyme contains 2% of sulphur. The molecular weight of the Enzyme is 6400. How many sulphur atoms are present in that enzyme molecule?

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2. The weight of a gaseous mixture containing 12.044×10^{23} atoms of He and 3.011×10^{23} molecules of hydrogen is _____g.

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3. The weight of methane which occupies the same volume at STP as 7.5 gmof ethane is _____g .A compound contains 40% carbon 6.6% hydrogen and the rest oxygen. If 100 ml of its decimolar solution contains 1.8 gms of its how many emperical units are present in its molecule?

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4. A compound contains 40% carbon 6.6% hydrogen and the rest oxygen. If 100 ml of its decimolar solution contains 1.8 gms of it, how many emperical units are present in its molecule?

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5. Air contains 20% O_2 by volume. An alkane $\left(C_xH_y\right)$ requires 10 tims its volume of air for complete combustion. What is y/x?

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6. 4.4 gms of a hydrocarbon on complete combustion produced 13.2 gms of CO_2 and 7.2 gms of H_2O.

How many moles of oxygen is consumed per mole of hydrocarbon in the combustion?

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Lecture Sheet Exercise Ii Straight Objective Type Questions

1. The oxidation number of nitrogen in HN_3 is

A. $+1/3$

B. $+3$

C. $-1/3$

D. -1

Answer: C

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2. Oxidation state of Fe in $K_4\left[Fe(CN)_6\right]$

A. Oxidation number of and valency of oxygen in OF_2 are

B. $+1, 2$

C. $+2, 2$

D. $+1, 1$

Answer: C

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3. Oxidation number and valency of oxygen in OF_2 are

A. $+1, 2$

B. $+2, 2$

C. $+1, 1$

D. $+2, 1$

Answer: B

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4. In the conversion of $K_2Cr_2O_7$ to K_2CrO_4 the oxidation number of the following changes

A. K

B. Cr

C. Oxygen

D. None

Answer: D

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5.

List-1	List-2
A) + 3 Oxidation state	1) Nitrogen
B) + 1 Oxidation state	2) Nitrous oxide
C) 0 Oxidation state	3) Nitrate ion
D) + 5 Oxidation state	4) Hydroxylamine
	5) Nitrite ion

The correct match is

A.

A	B	C	D
1	4	3	2

B.
A	B	C	D
5	2	4	3

C.
A	B	C	D
4	5	3	1

D.
A	B	C	D
5	2	1	3

Answer: D

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6. The oxidation state of phosphorus in $Ba(H_2PO_2)_2$ is

A. $+3$

B. $+2$

C. $+1$

D. -1

Answer: C

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7. In bleaching powder oxidation states of Cl are

A. $-1, +2$

B. $-2, +1$

C. $-1, +1$

D. $-2, +1$

Answer: C

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8. (A): Oxidation state of carbon in $C_6H_{12}O_6$ is zero.

(R) : Oxidation state of carbon in all organic compounds is zero.

A. Both (A) and (R) are true and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A).

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Answer: C

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9. Iron has the lowest oxidation state in

A. $FeSO_4$

B. $K_4[Fe(CN)_6]$

C. $Fe(CO)_5$

D. FeO

Answer: C

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10. The oxidation number of Cr is CrO_5 is

A. $+10$

B. $+6$

C. $+4$

D. $+5$

Answer: B

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11. In the reaction $P_4 + 3OH^- + 3H_2O \rightarrow 3H_2PO_2 \rightarrow 3H_2PO_2^- + PH_3$ phosphorus is undergoing.

A. oxidation

B. reduction

C. disproportionation

D. hydrolysis

Answer: C

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12. Which of the following is not a redox reaction?

A. $2BaO + O_2 \rightarrow 2BaO_2$

B. $BaO_2 + H_2SO_4 \rightarrow BaSO_4 + H_2O_2$

C. $2KClO_3 \rightarrow 2KCl + 3O_2$

D. $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$

Answer: B

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13. Which one of the following is not prepared from halide by chemical oxidation process

A. F_2

B. Cl_2

C. Br_2

D. I_2

Answer: A

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14. Among the following ion the one that cannot undergo disproportionation

A. ClO^-

B. ClO_2^-

C. ClO_3^-

D. ClO_4^-

Answer: D

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15. In $C + H_2O \rightarrow CO + H_2$, H_2O acts as

A. Oxidising agent

B. Reducing agent

C. Both a and b

D. None of these

Answer: A

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16. Which one of the following generally gets displaced by more electro positive metals in nonmetal displacement reactions.

A. H_2

B. N_2

C. F_2

D. Cl_2

Answer: A

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Lecture Sheet Exercise Ii More Than One Correct Answer Type Questions

1. The different oxdisation state (s) exhibited by oxygen is (are)

A. -2

B. -1

C. 0

D. $-\frac{1}{2}$

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

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2. Which of the following 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. $H_2SO_5 > H_2SO_3 > SCl_2 > H_2S$

D. $H_2SO_4 > SO_2 > H_2S > H_2S_2O_8$

Answer: A::C::D

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3. Which molecules represented by the bold atoms show their highest oxidation state?

A. $H_2\underline{S_2}O_8$

B. $\underline{P}_4O_{10}$

C. $\underline{F_2}O$

D. $\underline{Mn_2}O_7$

Answer: A::B::D

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4. Select the correct statements:

A. Oxidation number of oxygen in O_2^+ is $+\frac{1}{2}$

B. Oxidation number of oxygen is O_2^- is $-\frac{1}{2}$

C. Oxidation number of Cr in K_3CrO_8 is +5

D. Average oxidation number of Br in tribromooctaoxide (Br_3O_8) is $+\frac{18}{3}$

Answer: A::B::C

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Lecture Sheet Exercise Ii Linked Comprehension Type Questions

1. The oxidation number of an element in a compound decides its nature to acts as oxidant or reductant. Oxidation number is defined and the residual charge which an atom has or appears to have in a molecule whenal other atoms are removed from the molecule as ions. Oxidation number is frequently used interchangebly with oxidation state. The stock notations of oxidation number are based on the periodic property-electronegativity. An atom in a molecule can be assigned positive, negative or zero oxidation number by considering its environment. In few

cases, oxidation number can evenn be fractional.

Oxidation number of oxygen in K_2O, K_2O_2, KO_2, KO_3 are in the order:

A. $KO_3 < KO_3 < K_2O_2 < K_2O$

B. $KO_2 < KO_3 < K_2O < K_2O_2$

C. $K_2O < K_2O_2 < KO_2 < KO_3$

D. $KO_3 < K_2O < KO_2 < K_2O_2$

Answer: C

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2. The oxidation number of an element in a compound decides its nature to acts as oxidant or reductant. Oxidation number is defined and the residual charge which an atom has or appears to have in a molecule whenal other atoms are removed from the molecule as ions. Oxidation number is frequently used interchangebly with oxidation state. The stock notations of oxidation number are based on the periodic property-electronegativity. An atom in a molecule can be assigned positive,

negative or zero oxidation number by considering its environment. In few cases, oxidation number can evenn be fractional.

Oxidation number of Y in $YBa_2Cu_2O_7$ is +3, then oxidation number of Cu is:

A. $+7/3$

B. $+5/3$

C. $+2$

D. $+1$

Answer: A

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3. In the chemical change $aN_2H_4 + bBrO_3^- \rightarrow aN_2 + bBr^- + 6H_2O$, answer the following questions:

The element oxidised and reduced in the reaction are respectively:

A. N_2H_4, BrO_3^-

B. N, Br

C. H, Br

D. BrO_3^- , N_2H_4

Answer: B

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4. In the chemical change $aN_2H_4 + bBrO_3^- \rightarrow aN_2 + bBr^- + 6H_2O$, answer the following questions:

Thenumber of electrons lost or gained during the redox change are:

A. 8

B. 10

C. 12

D. 6

Answer: C

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5. In the chemical change $aN_2H_4 + bBrO_3^- \rightarrow aN_2 + bBr^- + 6H_2O$, answer the following questions:

The species acting as oxidant and reductant respectively are:

A. BrO_3^- , N_2H_4

B. N_2H_4, BrO_3^-

C. N_2, BrO_3^-

D. Br^- , N_2H_4

Answer: A

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Lecture Sheet Exercise Ii Matrix Matching Type Questions

1. Match the following columns

Column-I	Column-II
A) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$	P) Metathesis
B) $2KCl + Br_2 \rightarrow 2kBr + Cl_2$	Q) Reaction possible but not redox reaction
C) $2HCHO \xrightarrow{NaOH} HCOONa + CH_3OH$	R) Disproportionation
D) $AgSO_4 + Ag \rightarrow Ag_2SO_4$	S) Comproportionation
E) $BaCl_2 + K_2CrO_4 \rightarrow BaCrO_4 + 2KCl$	T) Reaction not possible

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2. Match the following columns

Element	The oxidation number shown by the element in its compounds
A) Nitrogen	P) −1
B) Chlorine	Q) +5
C) Oxygen	R) +7
D) Fluorine	S) +3
	T) +1

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Lecture Sheet Exercise Ii Integer Type Questions

1. The oxidation number of iron in brown ring complexes +x. What is value of x.

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2. The oxidation number of sulphur in caro's acid is +x. What is value of x.

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3. In first transition series elements the highest oxidation number shown is +x. What is the value of x.

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4. The oxidation number of hydrogen (per atom) in hydrolith as -x.What is value of x.

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5. In how may of the following compounds an elements has fractional oxidation number

$KO_2, N_3H, O_2F_2, NaN_3, Ni(CO)_4, Na_2S_4O_6, N_2H_6^{++}, KI_3.$

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6. When the redox reaction $Zn + NO_3^- \rightarrow Zn^{++} + NH_4^+$ is balanced by ion electron method in acid medium what is correct coefficinet of zinc.

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7. When the redox reaction

$Cr_2O_7^{--} + Fe^{++} + C_2O_4^{--} \rightarrow Cr^{+++} + Fe^{+++} + CO_2$

balanced by ion electron method in acid medium what is correct co-efficient of $Cr_2O_7^{--}$

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8. When the redox reaction

$$SnO_2^{--} + Bi(OH)_3 \rightarrow SnO_3^{--} + Bi$$

is balanced by ion electron method in basic medium what is correct coefficient of SnO_2^{--}

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Lecture Sheet Exercise Iii Straight Objective Type Questions

1. 2.76 g of silver carbonate on strong ignition leaves a residue weighing

A. 2.48 g

B. 2.16 g

C. 2.32 g

D. 2.84g

Answer: B

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2. 0.01 mole of iodoform (CHI_3) reacts with Ag powder to produce a gas whose volume at NTP is

A. 112 ml

B. 336 ml

C. None

D.

Answer: B

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3. Air contains 20% by volume of oxygen. The volume of air required for the compoete combustion of 1L of methane under the same conditions is

A. 2L

B. 4L

C. 10L

D. 0.4L

Answer: C

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

A. 16.8 g

B. 8.4 g

C. 11.6 g

D. 4.2 g

Answer: B

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5. X litre of carbon monoxide is present at mSTP. It is completely oxidised to CO_2 . Formed is 11.207 l. What is the vlue of X in litres?

A. 22.414

B. 11.207

C. 5.6035

D. 44.828

Answer: B

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6. The number of moles of KI required to produce 0.4 mole K_2HgI_4 is

A. 1

B. 3

C. 6

D. 1.6

Answer: D

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7. When 20 ml of methane and 20 ml of oxygen are exploded together and the reaction mixture is cooled to laboratory temperature. The resulting volume of the mixture is

A. 40 ml

B. 20 ml

C. 30ml

D. 10ml

Answer: B

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8. Acetylene can be prepared from calcium carbonate by a series of reactions. The mass of 80% calcium carbonate required to prepare 2 moles of acetylene is

A. 200g

B. 160g

C. 250 g

D. 320 g

Answer: C

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9. Sodium carbonate of 92% purity is used in the reation $Na_2CO_3 + CaCl_2 \rightarrow CaCO_3 + 2NaCl.$ The number of grams of Na_2CO_3 required to yield 1 gm of $CaCO_3$

A. $8.5g$

B. $10.5g$

C. $11.52g$

D. $1.152g$

Answer: D

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10. 4g of mixture of Na_2CO_3 and $NaHCO_3$ on heating liberates 448 ml of CO_2 at STP. The percentage of Na_2CO_3 in the mixture is

A. 84

B. 16

C. 54

D. 80

Answer: B

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11. 25.5 g of H_2O_2 solution on decomposition gave 1.68 L of O_2 at STP. The percentage strength by weight of the solution is

A. 30

B. 10

C. 20

D. 25

Answer: C

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12. How much $Ca(NO_3)_2$ in mg must be present in 50 ml of a solution with 2.35 ppm of Ca?

A. 0.1175

B. 770.8

C. 4.7

D. 0.48

Answer: D

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13. 500 ml of a 0.1 N solution of $AgNO_3$ added to 500 mlof 0.1 N solution of KCI. The concentration of nitrate ion in the resulting mixture is

A. 0.05 N

B. 0.1 N

C. 0.2 N

D. reduced to zero

Answer: A

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14. 0.84 g of a acid (mol wt. 150) was dissolved in water and the volume was made up to 100 ml. 25 ml of this solution required 28 ml of (N/10) NaOH solution for neutralisation. The equivalent weight and basicity of the acid

A. 75,2

B. 150,1

C. 75,4

D. 150,2

Answer: A

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15. 0.70 g of a sample of $Na_2CO_3.xH_2O$ were dissolved in water and the volume was made to 100 ml. 20 ml of this solution required 19.8 ml of (N/10) HCl for complete neutralisation. The value of x is

A. 2

B. 1

C. 4

D. 10

Answer: A

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Lecture Sheet Exercise Iii More Than One Correct Answer Type Questions

1. Combustion of 2.24 its ethane at STP requires

A. 7.84 lts of O_2

B. 0.35 moles of O_2

C. 11.2 gms of O_2

D. 5.6 lts of O_(2)` at STP

Answer: A::B::C

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2. One mole Barium chloride and one mole Sodium phosphate are mixed in aqueous medium.

A. $BaCl_2$ acts as limiting reagent

B. Na_3PO_4 acts as limiting reagent

C. Half mole of $Ba_3(PO_4)_2$ is formed

D. 0.33 mole of $Ba_3(PO_4)_2$ is formed

Answer: A::D

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3. $10mlN_2$ is reacted with 20 ml H_2 to form NH_3. The correct statements is /are

A. 13.3 ml NH_3 is formed

B. 20 ml NH_3 is formed

C. 3.4 ml N_2 is left after the completion of the reaction

D. 16.7 ml NH_3 of mixture is left the completion of the reaction.

Answer: A::C::D

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4. 1 mole $Ba(OH)_2$ will exactly neutralize

A. 0.5 mole HCl

B. 1 mole of H_2SO_4

C. $1mo \leq of$H_(3)PO_(3)`

D. 3 mole H_3PO_2

Answer: B::C::D

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Lecture Sheet Exercise Iii Linked Comprehension Type Questions

1. 10 moles of SO_2 and 4 moles of O_2 are mixed in a closed vessel of volume 2 litres. The mixture is heated in the presence of Pt catalyst. Following reaction takes place:

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

Assuming the reaction proceeds to completion.

Select the correct statement.

A. SO_2 is the limiting reagent

B. O_2 is the limiting reagent

C. Both SO_2 and O_2 are limiting

D. Cannot be predicted

Answer: B

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2. 10 moles of SO_2 and 4 moles of O_2 are mixed in a closed vessel of volume 2 litres. The mixture is heated in the presence of Pt catalyst. Following reaction takes place:

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

Number of moles of SO_3 formed in the reaction will be

A. 10

B. 4

C. 8

D. 14

Answer: C

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3. 10 moles of SO_2 and 4 moles of O_2 are mixed in a closed vessel of volume 2 litres. The mixture is heated in the presence of Pt catalyst. Following reaction takes place:

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

Number of moles of excess reactant remaining

A. 4

B. 2

C. 6

D. 8

Answer: B

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4. Oleum is mixture of H_2SO_4 and SO_3 i.e. $H_2S_2O_7$ which is obtained by passing SO_3 is solution of H_2SO_4. In order to dissolve SO_3 in oleum, dilution of oleum is done by water in which oleum is converted into pure H_2SO as shown below:

$H_2SO_4 + SO_3 + H_2O \rightarrow 2H_2SO_4$ (pure)

When 100 gm oleum is diluted with water then total mass of diluted oleum is known as percentage labelling in oleum.

For example: $109\ \%\ H_2SO_4$ labelling of oleum sample means that 109 gm pure H_2SO_4 is obtained on diluting 100 gm oleum with 9 gm H_2O which dissolves al free SO_3 in oleum.

If the number of moles of free SO_3, H_2SO_4, and H_2O be x, y and z respectively in $118\%H_2SO_4$ labelled oleum, the value of $(x+y+z)$ is

A. 2.2

B. 3.2

C. 3.4

D. 4.2

Answer: A

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5. Oleum is mixture of H_2SO_4 and SO_3 i.e. $H_2S_2O_7$ which is obtained by passing SO_3 is solution of H_2SO_4. In order to dissolve SO_3 in oleum, dilution of oleum is done by water in which oleum is converted into pure H_2SO as shown below:

$H_2SO_4 + SO_3 + H_2O \rightarrow 2H_2SO_4$ (pure)

When 100 gm oleum is diluted with water then total mass of diluted oleum is known as percentage labelling in oleum.

For example: $109\,\%\ H_2SO_4$ labelling of oleum sample means that 109 gm pure H_2SO_4 is obtained on diluting 100 gm oleum with 9 gm H_2O which dissolves al free SO_3 in oleum.

If 109% H_2SO_4 labelled oleum, the percent of free SO_3 and H_2SO_4 are

A. 30%, 70%

B. 40%, 60%

C. 60%, 40%

D. 15%, 85%

Answer: B

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Lecture Sheet Exercise Iii Matrix Matching Type Questions

1.

List -I	List -II
A) 1.72 g impure $FeSO_4$ consumed 20 mL of 0.1M acidic $KMnO_4$	P) 75% pure sample
B) 8.4 gm impure $H_2C_2O_4.2H_2O$ consumed 0.1mole NaOH	Q) 79.67% pure sample
C) 9.84g $FeSO_4(NH_4)_2SO_4.6H_2O$ impure sample reduced 0.02 equivalent $K_2Cr_2O_7$ acidic solution	R) 79.1% pure sample
D) 1.87eq H_2O_2 reduced 75gm impure $KMnO_4$ in acidic medium	S) 88.37% pure sample

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2. Match the following columns

List -I (Reaction)	List - II (Type of Salt)
A) 1 mole of oxalic acid + 1 mole of NaOH	P) Mixed salt
B) 1 mole of H_3PO_2 + 1 mole KOH	Q) Basic salt
C) 1 mole of $Ca(OH)_2$ + 1 mole of HCl	R) Acid salt
D) Dry slaked lime + Cl_2	S) Normal salt

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Lecture Sheet Exercise Iii Integer Type Questions

1. What is $\frac{\text{mol. Wt}}{\text{Eq. wt}}$ of FeC_2O_4 getting converted into Fe^{+3} and CO_2?

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2. Eq. wt $\frac{\text{Mol wt}}{x}$ What is x for acetaldehyde converted into acetic acid.

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3. Methane is converted into faormaldehyde. What is the ratio of molecular weight to equivalent weight of Methane?

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4. What is the equlivalent weight of methane during its Combustion?

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5. For the following reaction

$N_2 + 3H_2 \rightarrow 2NH_3$ equivalent mass of $N_2 = \frac{\text{molar mass of} N_2}{X}$

What is the value of x.

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6. On heating 1.763 g of hydrated $BaCl_2.nH_2O$ to dryness, 1.505 g of anhydrous salt remaind. What is the value of n (Mol wt of $BaCl_2 = 208$)

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7. What is the $\frac{\text{Mol wt}}{\text{Eq.wt}}$ ratio of $Fe_2(SO_4)_3$ being converted into $Fe(OH)_3$

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Lecture Sheet Exercise Iv Straight Objective Type Questions

1. 500 ml of a 0.1 N solution of $AgNO_3$ added to 500 ml of 0.1 N solution of KCl.The concentration of nitrate ion in the resulting mixture is

A. 0.05 N

B. 0.1 N

C. 0.2 N

D. reduced to zero

Answer: A

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2. What will be present in th solution when 50 of ml 0.1 M HCl is mixed with 50 ml of 0.1 M NaOH soltion?

A. 4.5 millimole of H^+

B. 0.05 millimole of OH^-

C. 0.1 M NaCl

D. $10^{-7}M$ of H^+ ion

Answer: D

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3. Number of moles of $KMnO_4$ required to oxidize one mole of $Fe(C_2O_4)$ in acidic medium is

A. 0.6

B. 0.167

C. 20

D. 40

Answer: A

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4. $H_2C_2O_4.2H_2O$ (Mol wt =126) can be oxidised intoCO_2 by acidified $KMnO_4$. 6.3 gms of oxalic acid can not be oxidised

A. 3.16 gms of $KMnO_4$

B. 200 mlof 0.1 M $KMnO_4$

C. 0.1 mole of $KMnO_4$

D. 0.02 moles of $KMnO$

Answer: C

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5. 10 g sample of H_2O_2 just decolorised 100 ml of 0.1 M $KMnO_4$ in acidic medium % by mass of H_2O_2 in the sample is

A. 3.4

B. 8.5

C. 17

D. 1.7

Answer: B

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6. If x g is the mass of $NaHC_2O_4$ required to neutralize 100 ml of 0.2 M NaOH and y g that required to reduce 100 ml of 0.02 M $KMnO_4$ in acidic medium then

A. $x = y$

B. $2x = y$

C. $x = 4y$

D. $4x = y$

Answer: C

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7. What volume at STP of gaseous ammonia wil be required to be passed into 100 ml of 0.5M H_2SO_4 to bring down its strength of 0.25 M?

A. 1.560 L

B. 1.120 L

C. 1.680 L

D. 2.240 L

Answer: B

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8. 20 ml of $0.1MFeC_2O_4$ solution is titrated with $0.1MKMnO_4$ is acidic medium. Volume of $KMnO_4$ solution required to oxidise FeC_4O_4 completely is

A. 20 ml

B. 12 ml

C. 8 ml

D. 4 ml

Answer: B

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9. To neutralize completely 20 ml of 0.1 M phosphorus acid, 40 mol of KOH was required. What volume of this KOH solution will be required to neutralize 0.66 g of H_3PO_2?

A. 100 ml

B. 200 mlof 0.1 M $KMnO_4$

C. 300 ml

D. 66.7 ml

Answer: A

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10. During the titration of a mixture of Na_2CO_3 and $NaHCO_3$ against HCl

A. phenolphthalein is used to detect the first end point

B. phenophthalein is used to detect the second end point

C. methyl orange is used to detect the first end point.

D. methyl red is used to detect the first end point

Answer: A

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Lecture Sheet Exercise Iv More Than One Type Questions

1. Which relation involve iodimetric titration?

A. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

B. $2MNO_4^- + 2I^- + 16^+ \rightarrow 2Mn^{+2} + 8H_2O + 5I_2$

C. $Na_3AsO_3 + I_2 + H_2O \rightarrow Na_3AsO_4 + 2HI$

D. $Cr_2O_7^{-2} + 14H^+ + 5I^- \rightarrow 2Cr^{+3} + 7H_2O + 3I_2$

Answer: A::C::D

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2. Which of the following are valid iodometric titractions?

A. $HClO + 2I^- + H^+ \rightarrow Cl^- + I_2 + H_2O$

B. $O_3 + 2I^- + 2H^+ \rightarrow O_2 + I_2 + H_2O$

C. $2HNO_2 + 2I^- + 2H^+ \rightarrow I_2 + 2NO + H_2O$

D. $8HNO_3 + 6I^- \rightarrow 6NO_3^- + 2NO + 3I_2 + 4H_2O$

Answer: A::B::C

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3. One mole of $KMnO_4$ is used for complete oxidation of $FeSO_4$, FeC_2O_4 and $H_2C_2O_4$ respectively and separately. Pick up the correct statement.

A. 5 mole of $FeSO_4$ can be oxidised

B. 3/5 mole of FeC_2O_4 can be oxidized

C. 5/3 mole of FeC_2O_4 can be oxidized

D. 2.5 mole of $H_2C_2O_5$ canbe oxidized

Answer: A::C::D

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Lecture Sheet Exercise Iv Linked Comprehension Type Questions

1. 50 ml of given H_2O_2 solution is added to excess KI solution in acidic medium. The liberated I_2 required 20 ml of 0.04 M standard Hypo solution.

Molarity of H_2O_2 solution is

A. $8 \times 10^{-3} M$

B. $4 \times 10^{-3} M$

C. $5 \times 10^{-3} M$

D. None of these

Answer: A

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2. 50 ml of given H_2O_2 solution is added to excess KI solution in acidic medium. The liberated I_2 required 20 ml of 0.04 M standard Hypo solution.

Weight of H_2O_2 present in 250 ml of given solution is

A. 0.034 g

B. 0.068 g

C. 0.136 g

D. None of these

Answer: B

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3. A quantity of 25.0 mL of solution containing both Fe^{2+} and Fe^{3+} ions is titrated with 25.0 mL of 0.0200 $MKMnO_4$ (in dilute H_2SO_4). As a result, all of the Fe^{2+} ions are oxidised to Fe^{3+} ions.

Next 25 mL of the original solution is treated with Zn metal finally, the solution requires 40.0 mL of the same $KMnO_4$ solution for oxidation to Fe^{3+}.

$$MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$$

Zinc aded in the second titration wil

A. oxidize Fe^{2+} to Fe^{3+}

B. reduce Fe^{3+} to Fe^{2+}

C. reduce Fe^{3+} to Fe

D. reduce Fe^{2+} to Fe

Answer: B

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4. A quantity of 25.0 mL of solution containing both Fe^{2+} and Fe^{3+} ions is titrated with 25.0 mL of 0.0200 $MKMnO_4$ (in dilute H_2SO_4). As a result, all of the Fe^{2+} ions are oxidised to Fe^{3+} ions.

Next 25 mL of the original solution is treated with Zn metal finally, the solution requires 40.0 mL of the same $KMnO_4$ solution for oxidation to Fe^{3+}.

$$MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$$

IF 0.02 $MK_2Cr_2O_7$ is used instead of 0.02 M $KMnO_4$ its volume required in these titrations are respectively

A. 25mL, 40mL

B. 25mL, 15mL

C. 20.8 mL 33.3 mL

D. 10.4 mL , 16.7 mL

Answer: C

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Lecture Sheet Exercise Iv Matrix Type Questions

1. Match the following columns

List - I	List - II
A) 1 mole $NaOH$	P) 0.5 mole H_2SO_4
B) 0.5 mole $Ca(OH)_2$	Q) 1 mole HCl
C) 2 moles $KMnO_4$	R) 10 moles Mohr's salt solution
D) 1 mole $K_2Cr_2O_7$	S) 5 moles oxalic acid solution

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Lecture Sheet Exercise Iv Integer Type Questions

1. 100 mL of 0.01 MXO_4^- is reduced to X^{n+} by 100 mL of 0.05 M Fe^{2+} in acidic medium. Thus oxidation state of X in X^{n+} is _____

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2. 25 mL of 0.1 M solution of metallic salt (A) oxidised 25 mL of 0.1 M sodium sulphite to sodium sulphate. If oxidation number of the metal in

the salt (A) is 3, then new oxidation number of the metal is _____

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3. 25 mL of a solution containing $6.1gL^{-1}$ ofan oxalate of formula $K_xH_y(C_2O_4)_z.nH_2O$ required 18 mL of 0.1 N NaoH and 24 mL of 0.1 $KMnO_4$ in the separate titrations. Thus $x+y+z+n=$

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4. Euivalent weights of two oxides of an element are 14 and 11 respectively. What is the ratio of atomicity of oxygen in the second oxide to first oxide?

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Practice Sheet Exercise I Level I Straight Objective Type Questions

1. One mole of sodium represents

A. 6.02×10^{23} atoms of sodium

B. 46 gms of sodium

C. 11g of sodium

D. 34.5 g of sodium

Answer: A

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2. The charge present on 1 mole electronsis

A. 96500 Coulombs

B. Coulomb

C. $1.60 \times 10^{-19} C$

D. 0.1 Faraday

Answer: A

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3. The gas which is twice as dense as oxygen under the same conditions is

A. Ozone

B. Sulphur trioxide

C. Sulphur dioxide

D. Carbon dioxide

Answer: C

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4. Oridinary water contain one part of heavy water per 6000 parts of water by weight. The number of heavy water molecules present in a drop of water of volume 0.01 mL is (density of water 1 g/mL)

A. 2.5×10^{16}

B. 5×10^{17}

C. 5×10^{16}

D. 7.5×10^{16}

Answer: B

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5. Assuming that air at STP contained 80% by volume of nitrogen, the volumeof air at STP that contains 4.8×10^{23} molecules of notrogen is

A. 18L

B. 44.8 L

C. 22.4 L

D. 11.2 L

Answer: C

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6. The percentage of nitrogen in Magnesium nitride is

A. 14

B. 28

C. 42

D. 56

Answer: B

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7. An element X forms two oxides. Formula of the first oxide is XO_2. The first contains 50% of oxygen. If the second oxide contains 60% oxygen, the formula of the second oxide is

A. XO_3

B. X_2O_3

C. X_3O_2

D. X_2O

Answer: A

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8. Two gaseous samples were analysed. One contained 1.2 g of carbon and 3.2 g of oxygen. The other contained 27.3% carbon and 72.7% oxygen. The experiemental data is an accordance with

A. Law of conservation of mass

B. Law of definite proportions

C. Law of reciprocoal proportions

D. Law of multiple proportions

Answer: B

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9. Which of the following has number of molecules present equal to those present in 16 grams of oxygen

A. $16gO_3$

B. $32gSO_2$

C. $16gSO_2$

D. All the above

Answer: B

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10. The ratio between the number of molecules in equal masses of CH_4 and SO_2 is

A. $1:1$

B. $4:1$

C. $1:4$

D. $2:1$

Answer: B

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Practice Sheet Exercise I Level Ii Straight Objective Type Questions

1. The density of a gas at STP is 1.5 g/L. Its molecular weight is

A. 22.4

B. 33.6g

C. 33.6

D. 44.8

Answer: C

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2. The number of oxygen atoms present in 50 g of calcium carbonate is

A. 6.023×10^{23}

B. 30.1×10^{23}

C. 9.035×10^{23}

D. 1.20×10^{24}

Answer: C

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3. 8 gm of sulphus is completely burnt to get sulphur dioxide. The number of molecules of SO_2 obtained is

A. $6 \times x10^{23}$

B. 3×10^{23}

C. 1.5×10^{23}

D. 7.5×10^{22}

Answer: C

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4. The density of water is 1g/mL. Assuming that there are no intermolecular spaces between water molecules in liquid water, the volume of a water molecule is

A. 1.5×10^{-23} ml

B. 6×10^{-23}ml

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

D. 3×10^{-22}ml

Answer: C

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List-I (Molecules)	List-II (Empirical formula)
A) Glucose	1) BNH_2
B) Oxalic acid	2) CH_2O
C) Inorganic Benzene	3) CH
D) Oxygenated water	4) CHO_2
	5) HO

5.

The correct match is

A. $\begin{matrix} A & B & C & D \\ 3 & 5 & 2 & 4 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 2 & 4 & 1 & 5 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 1 & 3 & 2 & 4 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 4 & 2 & 1 & 3 \end{matrix}$

Answer: B

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6. Assertion: (A): Emprirical formula of ethane is CH_3

Reason (R): Empirical formula of all alkenes is CH_2

The correct answer is

A. Both A and R are true and R is the correct explanation of (A)

B. Both A and R are true and R is not the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: B

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7. Assertion A: Empiricial formula of glucose or that of acetic acid is CH_2O.

Reason(R):If percentage composition of elements is same, then empirical formula is same.

The correct answer is

A. Both A and R are true and R is the correct explanation of (A)

B. Both A and R are true and R is not the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: A

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8. Assetion(A): Acetylene on additional polymerization gives benzene.

Reason(R): The empirical formulae of acetylene and benzene are same

The correct answer is

A. Both A and R are true and R is the correct explanation of (A)

B. Both A and R are true and R is not the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: B

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9. An alkaloid contains 17.28% of nitrogen and its molecular mass is 162. The number of nitrogen atoms present in one molecule of the alkaloid is

A. five

B. four

C. three

D. two

Answer: D

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10. A compound contains 20% sulphur. The molecular weight of the compound could be

A. 80

B. 240

C. 400

D. 640

Answer: D

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Practice Sheet Exercise I Level Ii More Than One Correct Answer Type Questions

1. 6.023×10^{22} atoms of Hydrogen can make

A. 0.05 moles of H_2 molecules

B. 0.1 gms of Hydrogen atoms

C. 0.1 gram of molecules of Hydrogen

D. 0.1 gramatoms of Hydrogen

Answer: A::B::D

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2. Equal volume of oxygen and ozone at a given temperature and pressure contain equal

A. number of moles

B. masses

C. number of granmatoms

D. number of respective molecules

Answer: A::D

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3. A and B are two elements which form AB_2 and A_2B_3 if 0.18 mole of AB_2 weights 10.6 g and 0.18 mole of A_3B_3 weighs 17.8 g.Then

A. Atomic weight of A is 21.2

B. Atomic weight fo B is 21.2

C. Atomic weight of A is 18.8

D. Atomic weight of B is 18.8

Answer: A::D

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4. Which compound has less percentage of nitrogen by mass than in N_2H_4?

A. N_3H

B. NH_3

C. HNO_3

D. N_2O_5

Answer: B::C::D

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5. 18 gms of glucose contains

A. 0.6 gram atoms of carbon

B. 0.6 grammolecules of Hydrogen

C. 0.6 grammolecules of CO_2

D. 1.2 gramatoms of Hydrogen

Answer: A::B::D

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Practice Sheet Exercise I Level Ii Linked Comprehension Type Questions

1. Avogadro's lasw states that under conditions of constant temp. and pressure equal volume of gases contain equal no. of particles. Experimental investigation shows that at one atmosphere pressure and a temperature of 273 k, one mole of any gas occupies a volume of which is very close to 22.4 lit. Therefore, the number of moles in any gas sample

canbe found by comparing its volume at STP with 22.4 lit.

If avagadro's number is 6×10^{23} molecules then the mass of one atom of oxygen would be

A. $\frac{16}{3.02}$ amu

B. 6×10^{-23} amu

C. 16 amu

D. 16×6.02 amu

Answer: C

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2. Avogadro's lasw states that under conditions of constant temp. and pressure equal volume of gases contain equal no. of particles. Experimental investigation shows that at one atmosphere pressure and a temperature of 273 k, one mole of any gas occupies a volume of which is very close to 22.4 lit. Therefore, the number of moles in any gas sample

canbe found by comparing its volume at STP with 22.4 lit.

At STP 40 lit of CO_2 contains

A. 5.6 mole

B. 1.786 mole

C. 7.635 mole

D. 1.934 mole

Answer: B

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3. Avogadro's lasw states that under conditions of constant temp. and pressure equal volume of gases contain equal no. of particles. Experimental investigation shows that at one atmosphere pressure and a temperature of 273 k, one mole of any gas occupies a volume of which is very close to 22.4 lit. Therefore, the number of moles in any gas sample canbe found by comparing its volume at STP with 22.4 lit.

Number of gram atoms of oxygen present in 0.3 gram mole of $H_2C_2O_4.2H_2O$ is

A. 0.3

B. 0.6

C. 1.2

D. 1.8

Answer: D

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4. A gaseous hydrocarbon consumed 5 times its volume of oxygen as for combustion. The volume of CO_2 produced in the reaction is thrice the volume of hydrocarbon under the same conditions

How many grams of water is produced by combustion of 0.1 mol of the givenn hydrocarbon?

A. 7.2 gm

B. 3.6 gm

C. 14.4 gm

D. 1.8 gm

Answer: A

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5. A gaseous hydrocarbon consumed 5 times its volume of oxygen as for combustion. The volume of CO_2 produced in the reaction is thrice the volume of hydrocarbon under the same conditions

What is the ratio of molecular weight to emperical formula weight of the hydrocarbon?

A. 1

B. 2

C. 3

D. 4

Answer: A

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6. Match the following columns

List - I	List - II
A) N_2	P) 40% carbon by mass
B) CO	Q) Empirical formula CH_2O
C) $C_6H_{12}O_6$	R) Vapour density : 14
D) CH_3COOH	S) $14N_A$ electrons in a mole

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7. Match the following columns

List - I	List - II
A) Ethyne	P) Emperical formula 'CH'
B) Benzene	Q) 80% carbon by mass
C) Ethane	R) 50% carbon by atomicity
D) Butadiene	S) Two emperical formula units per molecule
	T) 10% hydrogen by mass

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Practice Sheet Exercise I Level Ii Integer Type Questions

1. Rahul Dravid wants to wear 6.023×10^{21} Ag atms in the form of a ring. His Silver Gold Copper alloy ring consists of 20% of Silver. The mass of the ring is 0.9 x. What is x?

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2. A copper plate of 20 cm x 10 cm is to be plated with silver of 1 mm thickness on both the sides. Number of moles of silver required for plating is (density of silver =10.8 g m /cc)_____

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3. A gaseous hydrocarbon on combustion produces four times its volume of CO_2 by consuming six times its volume of oxygen. What is the ratio of atoms of Hydrogen and carbon in that hydrocarbon?

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4. 0.1 moles of Hydrocaron on complete combustion produced 17.6 gms of CO_2. How many Carbon atoms are present in each molecule of the hydrocarbon.

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5. A gaseous paraffin requires five times its volume of oxygen for complete combustion. How many carbon atoms are present in a molecule of that paraffin?

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6. Sulphur trioxide is prepared by the following two reactions:

$S_{8(s)} + 8O_{2(g)} \rightarrow 8SO_{2(g)}, 2SO_{2(g)} + O_{2(g)} \rightarrow 2So_{3(g)}$

How many grams of SO_3 are produced from $1.6gS_8$?

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7. How many moles of H_2SO_4 can be reduced to SO_2 by 2 moles of Aluminium?

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8. How many moles of Mg can reduce one mole of dil. HNO_3 into NH_4^+ ions ?

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9. 12 grams of a mixture of sand and calcium carbonate on strong heating produced 7.6 grams of residue. How many grams of sand is present in the mixture?

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10. 2 moles of pure $KClO_3$ is decomposed to an extent of 66.6%. How many does of O_2 is released?

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Practice Sheet Exercise Ii Level I Straight Objective Type Questions

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

A. $+2$

B. $+3$

C. $+1$

D. $+6$

Answer: B

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2. $MnO_4^- + SO_3^{2-} + H^+ \rightarrow Mn^{2+} + SO_4^{2-}$.

The number of H^+ ions involved is

A. 2

B. 6

C. 8

D. 16

Answer: B

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3. $Cr(OH)_3 + H_2O_2 \xrightarrow{\text{Alkali}} CrO_4^{-2} + H_2O$ the number of OH^- required to balance the above equation

A. 1

B. 3

C. 4

D. 6

Answer: C

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4. The oxidation number of V in $Rb_4[HV_{10}O_{28}]$ is

A. $+3$

B. $+5$

C. $+7$

D. $+6$

Answer: B

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5. In which reactions hydrogen is acting as an oxidizing agent?

A. with iodine to give hydrogen iodide

B. with lithium to give lithium hydride

C. with nitrogen to give ammonia

D. with sulphur to give hydrogen sulphide

Answer: B

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6. In Br_3O_8, oxidation numbers of three bromines are

A. $+6,\ +4,\ +6$

B. $+6,\ +2, 7$

C. $+8, 0,\ +8$

D. $+4,\ +4,\ +8$

Answer: A

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7.

$$\left[Fe(H_2O)_2(C_2O_4)_2\right]^{2-} + MnO_4^- + H^+ \rightarrow Fe^{3+} + CO_2 + Mn^{2+} + H_2$$

In this reaction, number of protons involved in the balanced equation are

A. 10

B. 8

C. 6

D. 0.04

Answer: B

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8. Which one of the following reactions is a redox reaction?

A. $Pb^{2+}(aq) + 2Cl^{-}(aq) \rightarrow PbCl_2(s)$

B. $AgNO_3(aq) + HCl(aq) \rightarrow AgCl(s) + HNO_3(aq)$

C. $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$

D. $2Al(s) + 3Cl(g) \rightarrow 2AlCl_3(s)$

Answer: D

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9. Oxidation number of sulpher in caro's acid

A. $+7$

B. $+6$

C. $+4$

D. $+2$

Answer: B

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10. What is the term for the electrode where oxidation occurs?

A. anode

B. cathode

C. oxidizing agent

D. reducing agent

Answer: A

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Practice Sheet Exercise Ii Level Ii Straight Objective Type Questions

1. An element A in a compound AB has oxidation number -n. IT is oxidized by $Cr_2O_7^{2-}$ in acid medium. In the experiment 1.68×10^{-3} moles of $K_2Cr_2O_7$ was used for 3.36×10^{-3} moles of AB. The new oxidation number of A after oxidation is

A. 3

B. $3 - n$

C. $n - 3$

D. $+n$

Answer: B

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2. What does the reducing agent do in an oxidation reduction reaction?

A. gains electrons from the oxidizing agent

B. loses electrons to the oxidizing agent

C. is always reduced

D. is reduced by the oxidizing agent

Answer: B

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3. The oxidation number of iron in $Fe + (2)(CO)_9$ is

A. $+1$

B. -9

C. $+9$

D. 0

Answer: D

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4. Oxygen exists in positive oxidation state only in

A. Peroxides

B. Polymers

C. Fluorides

D. Iodides

Answer: C

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5. In which SO_2 acts as oxidant, while reacting with

A. Acidified $KMnO_4$

B. acidified $K_2Cr_2O_7$

C. H_2S

D. acidified C_2H_5OH

Answer: C

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6. Which of the following shows highest oxidation number in combined state

A. Os

B. Ru

C. Both a and b

D. None

Answer: C

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7. Given the lead acid battery reaction:

$2PbSO_4 + 2H_2O \Leftrightarrow Pb + PbO_2 + H_2SO_4$

Charege $\rightarrow$ $\leftarrow$ Discharge

Which species is oxidized during battery discharge?

A. SO_4^{2-}

B. H_2O

C. Pb

D. PbO_2

Answer: C

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8. The oxidation number of covalency of sulphur in the sulphur molecule (S_8) are

A. 0 and 2

B. $+6$ and 8

C. 0 and 8

D. $+6$ and 2

Answer: A

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9. The oxidation state of tungsten in $Na_2W_4O_{13}.10H_2O$ is ?

A. $+12$

B. $+6$

C. 0

D. $+8$

Answer: B

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10. The number of moles of MnO_4^- and $Cr_2O_7^{-2}$ separately required to oxidise 1 mole of FeC_2O_4 each in acidic medium respectively

A. $0.5, 0.6$

B. $0.6, 0.4$

C. $0.4, 0.5$

D. $0.6, 0.5$

Answer: D

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Practice Sheet Exercise Ii Level Ii More Than One Correct Answer Type Questions

1. The oxidation number of carbon is zero is

A. HCHO

B. CH_2Cl_2

C. $C_6H_{12}O_6$

D. $C_{12}H_{22}O_{11}$

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

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2. Which one are not correct about $CH_2 = CCl_2$?

A. Both carbon are in +2 oxidation state

B. Both carbon are in -2 oxidation state

C. One carbon has +2 and other has -2 oxidation state

D. The average oxidation number of carbon is zero

Answer: A::B

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3. Which of the following reactions involve oxidation reduction?

A. $2Rb + 2H_2O \rightarrow 2RbOH + H_2$

B. $3Me + N_2 \rightarrow Mg_3N_2$

C. $NH_4Cl + NaOH \rightarrow NaCl + NH_3 + H_2O$

D. $4KCN + Fe(CN)_2 \rightarrow K_4\left[Fe(CN)_6\right]$

Answer: A::B

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4. Thermal decomposition of $(NH_4)_2Cr_2O_7$ involves.

A. Oxidation of N

B. Reduction of Cr

C. Disproportionation of compound

D. Intermolecular redox process

Answer: A::B::D

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5. For the reaction $2KClO_3 \rightarrow 2KCl + 3O_2$ which statements (s) is (are) correct?

A. It is disproportionation

B. It is intramolecular redox change

C. Cl atoms are reduced

D. Oxygen atoms are oxidized

Answer: B::C::D

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Practice Sheet Exercise Ii Level Ii Linked Comprehension Type Questions

1. Oxidation number is the charge which an atom of an element has in its ion or appears to have when present in the combined state. It is also called oxidation state. Oxidation number of any atom in the elementary state is zero. Oxidation number of a monoatomic ion is equal to the charge on it. In compounds of metals with non metals, metals have positive oxidation number while non metals have negative oxidation numbers. In compounds of two difference elements, the more

electronegative element has negative oxidation number whereas the other has positive oxidation number. In complex ions, the sum of the oxidation number of all the atoms is equal to the charge on the ion. If a compound contains two or more atoms of the same element, they may have same or different oxidation states according as their chemical bonding is same or different.

Oxidation number of sodium in sodium amalgam is

A. $+1$

B. 0

C. -1

D. $+2$

Answer: B

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2. Oxidation number is the charge which an atom of an element has in its ion or appears to have when present in the combined state. It is also

called oxidation state. Oxidation number of any atom in the elementary state is zero. Oxidation number of a monoatomic ion is equal to the charge on it. In compounds of metals with non metals, metals have positive oxidation number while non metals have negative oxidation numbers. In compounds of two difference elements, the more electronegative element has negative oxidation number whereas the other has positive oxidation number. In complex ions, the sum of the oxidation number of all the atoms is equal to the charge on the ion. If a compound contains two or more atoms of the same element, they may have same or different oxidation states according as their chemical bonding is same or different.

The oxidation state of the most electronegative element in the products of the reaction between BaO_2 and H_2SO_4 are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and +1

Answer: B

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3. Oxidation number is the charge which an atom of an element has in its ion or appears to have when present in the combined state. It is also called oxidation state. Oxidation number of any atom in the elementary state is zero. Oxidation number of a monoatomic ion is equal to the charge on it. In compounds of metals with non metals, metals have positive oxidation number while non metals have negative oxidation numbers. In compounds of two difference elements, the more electronegative element has negative oxidation number whereas the other has positive oxidation number. In complex ions, the sum of the oxidation number of all the atoms is equal to the charge on the ion. If a compound contains two or more atoms of the same element, they may have same or different oxidation states according as their chemical bonding is same or different.

A compound of Xe and F is found to have 53.3% Xe (atomic weight =133). Oxidation number of Xe in this compound is

A. $+2$

B. 0

C. $+4$

D. $+6$

Answer: D

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4. In the chemical chagne $aN_2H_4 + bBrO_3^- \rightarrow aN_2 + bBr^- + 6H_2O$, answer the following questions:

The number of electrons lost or gained during the redox change are

A. 8

B. 10

C. 12

D. 6

Answer: C

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5. In the chemical chagne $aN_2H_4 + bBrO_3^- \rightarrow aN_2 + bBr^- + 6H_2O$, answer the following questions:

The species acting as oxidant and reductant respectively are:

A. BrO_3^- , N_2H_4

B. N_2H_4, BrO_3^-

C. N_2, BrO_3^-

D. Br^- , N_2H_4

Answer: A

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Practice Sheet Exercise Ii Level Ii Matrix Matching Type Questions

1. Match the following columns

List - I	List - II
A) Element showing +8 oxidation state in its compounds	P) Ruthenium
B) Elements showing –2 oxidation state in its compounds	Q) Chlorine
C) Element showing +7 as maximum oxidation number in its compounds	R) Manganese
D) Element showing –3 oxidation state in its compounds	S) Sulphur
	T) Nitrogen

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2. Match the following columns

List - I	List - II
A) Oxidation number of chlorine in bleaching powder	P) –1
B) Oxidation number of sulphur in thio sulphuric acid	Q) –2
C) Oxidation number of phosphorous in sodium hypophosphite	R) +6
D) Oxidation number of nitrogen in ammonium ion	S) +1
	T) –3

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Practice Sheet Exercise Ii Level Ii Integer Type Questions

1. The oxidation number of carbon in Freon, and hydroge cyanide is +x and +y. What is the value x+y.

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2. The sum of oxidation numbers of all carbon atoms in carbon atoms in carbon suboxide is +x. What is value of x.

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3. One mole of hydrozine loses 10 moles of electrons.If all the hydrogen content is present in the product, the oxidation number of hydrogen in product is +x. What is value of x.

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4. How many of the following can be used as reducing agents.

coke, carbonmonoxide, hydrogen, potassium, aluminium.

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5. What is the electronegativity value on pauling scale of the halogen that does not under.....proportionation.

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6. How may of following are redox reactions:

-decomposition of magnesite.

- decomposition of potasium chlorate in presence of MnO_2.....

decomposition iron

- reaction of F_2 with HBr.

- Reaction of $AgNO_3$ with KCl to from silver chloride precipitate.

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7. How many of the following are correct statements.

-Valency of an element is always a whole number.

- In neutrilisation reaction between sulphuric acid and potassium SO_4^{--} and K^+ ion are spectator ions.

-Leade is .....stable in +2 oxidation state due to inert pair effect.

-Thallium salts in +3 oxidation state act as good reducing agents.

$-2H_2S + SO_2 \rightarrow 3S + 2H_2O$ is disproportionation reacts.

-Fluorine cannot be obtained from fluoride by chemical methods.

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8. When the redox reaction

$Cu_2O + NO_3^- \rightarrow LCu^{++} + NO$ is balanced by ion elecrtron method acidic medium.

What is correct co-efficient of Cu^{++}

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9. When the redox reaction.

$Cr_2O_7^{--} + C_2H_4O \rightarrow C_2H_4O_2 + Cr^{++}$ is balanced by ion electron method in acidic medium.

what is correct co-efficient of H^+ ions.

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10. When the redox (disproportionation) reaction

$S \rightarrow SO_3^{--} + S^{--}$ is balanced by ion electron method in basic medium.

What is correct co-efficient of S^{--}.

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Practice Sheet Exercise Iii Level I Straight Objective Type Questions

1. What volume of H_2 at NTP is required to convert 2.8 g of N_2 into NH_3?

A. 2240 ml

B. 2240 ml

C. 6.72 lit

D. 224 lit

Answer: C

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2. The amount of Mg in gms to be dissovled in dilute H_2SO_4 to liberate H_2 which is just sufficient to reduce 160 g of ferric oxide is

A. 24

B. 48

C. 72

D. 96

Answer: C

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3. The composition of LPG is butane and isobutane. The amount of oxygen that would be required for combustion of 1 kg of LPG will be

approximately.

A. 4.5 Kg

B. 1.8 Kg

C. 2.7 Kg

D. 3.6 Kg

Answer: D

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4. X forms an oxide X_2O_3 0.36 grams of X forms 0.56 grams of X_2O_3. So the atomic weight of X is

A. 36

B. 565

C. 28

D. 43.2

Answer: D

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5. 1g of Mg is burnt in a vessel containing 0.5 g of oxygen. The remaining unreacted is

A. 0.25 g of Mg

B. 0.1 g of Mg

C. 0.1 g of O_2

D. 0.75 g of Mg

Answer: A

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6. 20 ml of nitric oxide combines with 10 ml of oxygen at STP to give NO_2. The final volume will be

A. 30 ml

B. 20 ml

C. 10 ml

D. 40 ml

Answer: B

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7. 40 ml of a hydrocarbon undergoes combustion in 260 ml oxygen and gives 160 mlof CO_2. If all volumes are measured under similar conditions of temperature and pressue, the formula of the hydrocarbon is

A. C_3H_8

B. C_4H_8

C. C_6H_{14}

D. C_4H_{10}

Answer: D

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8. The volume of CO_2 that can be obtaind at STP from 60 g. of 70% pure $MgCO_3$ is

A. 16L

B. 11.2 L

C. 1.12 L

D. 5.6 L

Answer: B

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9. 70 g of a sample of magnesite on treatment with excess of HCl gave 11.2 L of CO_2 at STP. The percentage purify of the sample

A. 80

B. 70

C. 60

D. 50

Answer: C

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10. 7 g of a sample of sodium chloride on treatment with excess of silver nitrate gave 14.35 g of AgCl. The percentage of NaCl in the sample is

A. 80

B. 50

C. 65.8

D. 83.5

Answer: D

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Practice Sheet Exercise Iii Level Ii Straight Objective Type Questions

1. 18.4g of a mixture of $CaCO_3$ and $MgCO_3$ on heating gives 4.0g of magnesium oxide. The volume of CO_2 produced at STP in this process is

A. 1.12 L

B. 4.48 lilt

C. 2.24 L

D. 3.36 L

Answer: B

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2. The equivalent weights of S in SCl_2 and S_2Cl_2 are in the ratio

A. $1:2$

B. $2:1$

C. $1:1$

D. $1:4$

Answer: A

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3. Equivalent weights of $K_2Cr_2O_7$ in acidic medium is

A. 0.245

B. 0.49

C. 1.47

D. 2.96

Answer: B

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4. When Ferrous sulphate acts as reductant, its equivalent weight is

A. twice that of its molecular weights

B. equal to its molecular weight

C. one half of its molecular weight

D. one -third of its molecular weight

Answer: B

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5. What is the mole percentage of O_2 in a mixture of 7g of N_2 and 8g of O_2?

A. 0.25

B. 0.75

C. 0.5

D. 0.4

Answer: C

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6. One litre of a solution contains 18.9 gm of HNO_3 and one lire of another solution contains 3.2 gm of NaOH. In what volume ratio must these solutions be mixed to obtain a neutral solution?

A. $3:8$

B. $8:3$

C. $15:4$

D. $4:15$

Answer: D

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7. How many litres of CO_2 at STP wil be formed when 100 of $0.1MH_2SO_4$ reacts with excess of Na_2CO_3?

A. 22.4

B. 2.24

C. 0.224

D. 5.6

Answer: C

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8. 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

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9. 10 grams of $CaCO_3$ is completely decomposed to x and CaO. 'x' is passed into an aqueous solution containing 0.1mole of sodium carbonate. What is the number of moles of sodium bicarbonate formed? (mol. wts: $CaCO_3 = 100, NaCO_3 = 106, NaHCO_3 = 84$)

A. 0.2

B. 0.1

C. 0.01

D. 10

Answer: A

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10. The volume of CO_2 obtained by the complete decomposition of one mole of $NaHCO_3$ at STP is

A. 2.4 L

B. 11.2 L

C. 44.8 L

D. 4.48 L

Answer: B

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Practice Sheet Exercise Iii Level Ii More Than One Correct Type Questions

1. In which of the following reactions, no change in gaseous volume occurs when measured at similar T and P?

A. Combination of N_2 and O_2 to give NO

B. Combination of N_2 and H_2 to form NH_3

C. Combustion of carbon to give CO_2

D. Combustion of carbon monoxide

Answer: A::C

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2. One litre of CO_2 is passed over hot coke. The volume becomes 1.4 lit. The resultant mixture contains.

A. 0.6 lit CO_2

B. 0.6 lit CO

C. 0.8 lit CO

D. 0.8 lit CO_2

Answer: A::C

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3. Which relations between equivalent weight (E) and Molecular weight (M) of reactant are correct for the given change?

A. $FeCl_2$ int $Fe(OH)_2 : E = \frac{M}{2}$

B. $Fe_2(SO_4)_3$ into Fe^{+2}, $E = \frac{M}{2}$

C. $FeSO_4$ into $Fe_2(SO_4)_3$, $E = \frac{M}{2}$

D. K_2MnO_4 into $KMnO_4 : E = \frac{M}{2}$

Answer: A::B

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4. $K_4\left[Fe(CN)_6\right]$ is converted into CO_3^{-2}, Fe^{+3} ions and NO_3^- ions. Here_____

A. N is reduced

B. C is oxidised

C. Iorn is oxidised

D. Eq.wt $\frac{\text{Formula wt}}{61}$

Answer: B::C::D

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5. $4Mg + 10HNO_3 \rightarrow 4Mg(NO_3)_2 + NH_4NO_3 + 3H_2O.$ In this reaction

A. 96 gms magnesium can reduce one mole of HNO_3

B. Equivalent weight of reduced HNO_3 is $\frac{1}{8}$ of its molecular weight

C. Entire HNO_3 involved in the reaction is reduced

D. HNO_3 is reduced to the best possible extent

Answer: A::B::D

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Practice Sheet Exercise Iii Level Ii Linked Comprehension Type Questions

1. In a reaction vessel, $100gH_2$ and 100 g Cl_2 are mixed and suitable conditions are provided for the reaction: $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$

The amount of HCl formed in this reaction (at 100% yield) will be

A. 102.8 g

B. 73 g

C. 36.5 g

D. 142 g

Answer: A

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2. In a reaction vessel, $100gH_2$ and 100 g Cl_2 are mixed and suitable conditions are provided for the reaction: $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$

The amount of HCl formed (at 90% yield) will be

A. 36.8 g

B. 62.5 g

C. 80g

D. 92.53 g

Answer: D

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3. 50 ml of given H_2O_2 solution is added to excess KI solution in acidic medium. The liberated I_2 requires 20 ml of 0.04 M standard Hypo solution.

Molarity of H_2O_2 solution is

A. $8 \times 10^{-3} M$

B. $4 \times 10^{-3} M$

C. $5 \times 10^{-3} M$

D. None of these

Answer: A

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4. 50 ml of given H_2O_2 solution is added to excess KI solution in acidic medium. The liberated I_2 requires 20 ml of 0.04 M standard Hypo solution.

Weight of H_2O_2 present in 250 ml of given solution is

A. 0.034 g

B. 0.068 g

C. 0.136 g

D. None

Answer: B

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5. 50 ml of given H_2O_2 solution is added to excess KI solution in acidic medium. The liberated I_2 requires 20 ml of 0.04 M standard Hypo solution.

The strength of given 250 m H_2O_2 solution is

A. (a) 0.0272 g/100 cc

B. (b) 0.136 g/100cc

C. (c) 0.544g/100cc

D. (d) None of these

Answer: A

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Practice Sheet Exercise Iii Level Ii Matrix Matching Type Questions

1. Match the following columns

Column-I (Limiting reagent)	Column-II
A) N_2 (0.2 mole) + $3H_2$ (0.7 mole) $\rightarrow 2NH_3$	P) H_2
B) H_2 (1g) + $2C$ (24g) $\rightarrow C_2H_2$	Q) C
C) C (0.5g) + O_2 (2.24lit) $\rightarrow CO$	R) O_2
D) $2H_2$ (2g) + O_2 (2g) $\rightarrow 2H_2O$	S) N_2

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2.

Column-I	Column-II
A) $FeC_2O_4 + Cr_2O_7^{2-} + H^+ \longrightarrow$ Products	P) $\frac{M}{6}$
B) $Fe_3O_4 + MnO_4^- + H^+ \longrightarrow$ Products	Q) $\frac{M}{2}$
C) $KHC_2O_4 + MnO_4^- + H^+ \longrightarrow$ Products	R) M
D) $H_2O_2 + Cr_2O_7^{2-} + H^+ \longrightarrow$ Products	S) $\frac{M}{3}$

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Practice Sheet Exercise Iii Level Ii Integer Type Questions

1. One litre each of $1MAl_2(SO_4)_3$ and $1MBaCl_2$ are mixed. What is the molarity of sulphate ions in the resultant solution?

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2. How may moles of H_2O_2 must be present in 2L of its solution, such that 100 ml of the solution can liberate 3.2 grams of oxygen at $273^\circ C$ and 0.5 atm pressure?

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3. 70 gms of a metal oxide on reduction produced 54 gms of metal. The atomic weight of the metal is 81. What is its valency?

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4. 5.4 grams of a metal is able to produce 0.6 grams of H_2 gas with acid action. What is the equivalent weight of that metal?

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5. Equivalent weight of a metal chloride is 75.5. How many moles of NaOH is required to completely precipitate one mole of metal hydroxide. Atomic weight of the metal is 120.

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6. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

How many equivalents of Hypo is oxidised by one mole of Iodine?

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7. The equivalent mass of an element is 4. Its chloride has vapour density 59.25. Then the valency of the element is_____.

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8. Ionistable H atom in H_3PO_3 is x and in H_3PO_2 is y. Then ratio of x,y is

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9. 10 g of a metal carbonate on heating given 5.6 g of its oxide. The equivalent amont metale 5x. What is x.

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10. The reduction of 1.49 of a metal oxide required 560 ml of H_2 at STP. If atomic mass of metal is 40, formula of its chloride will be $MCl_x x =$ _____.

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Practice Sheet Exercise Iv Level I Straight Objective Type Questions

1. A mixture of $K_2C_2O_4$ and KHC_2O_4 required equal volumes of $0.1MK_2Cr_2O_7$ for oxidation and 0.1 M NOH for neutralisation is separate titratiosn. The molar ratio of K_2CrO_4 and KHC_2O_4 in the mixture is

A. $1:1$

B. $2:1$

C. $1:2$

D. $3:1$

Answer: B

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2. An equimolar mixture of $Na_2C_2O_4$ and $H_2C_2O_4$ required V_1L of $0.1MKMnO_4$ in acidic medium for complete oxidation. The same amount of the mixture required V_2L of 0.1 M NaOH for neutralization. The ratio of V_1 to V_2 is

A. $1:2$

B. $2:1$

C. $2:5$

D. $5:2$

Answer: C

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3. What volume at STP of gaseous ammonia will be required to be passed into 100 ml of $0.5MH_2SO_4$ to bring down its strength to 0.25 M?

A. 1.560 L

B. 1.120 L

C. 1.680 L

D. 2.240 L

Answer: B

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4. A mixture containing 0.05 mol of $K_2Cr_2O_7$ and 0.02 mol of $KMnO_4$ was treated with excess of KI in acidic medium.The liberated iodine required 2.0 L of Na_2SO_3 solution of titration. Concentration of $Na_2S_2O_3$ solution was

A. $0.125 \text{mol} L^{-1}$

B. $0.20 \text{mol} L^{-1}$

C. $0.25 \text{mol} L^{-1}$

D. $0.30 \text{mol} L^{-1}$

Answer: B

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5. The volume of 0.1 M $AgNO_3$ should be added to 10.0 ml of $0.09MK_2CrO_4$ to precipitate all the chromate as Ag_2CrO_4 is

A. 18 ml

B. 9 ml

C. 27 ml

D. 36 ml

Answer: A

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6. $0.1M - KMnO_4$ is used for the following titration. How much volume of the solution in ml will be required to react with 0.158 gm of $Na_2S_2O_3$?

$S_2O_3^{2-} + MnO_4^- + H_2O \rightarrow MnO_2(s) + SO_4^{2-} + OH^-$

A. `80ml

B. 26.67 ml

C. 13.33 ml

D. 16 ml

Answer: C

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7. X gm of KHC_2O_4 requires 100 ml of $0.02MKMnO_4$ in acidic medium. In another experiment, y gm of KHC_2O_4 requires 100 mkl of 0.05 M $Ca(OH)_2$. The ratio of x and y is

A. $1:1$

B. $1:2$

C. $2:1$

D. $5:4$

Answer: B

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8. 100 mL of H_2O_2 is oxidized by 100 mL of $1MKMnO_4$ in acidic medium (MnO_4^- reduced to Mn^{+2}) 100 mL of same H_2O_2 is oxidized by v mL of $1MKMnO_4$ in basic medium (MnO_4^- reduced to MnO_2). Find the value of v:

A. 500

B. 100

C. 100/3

D. 500/3

Answer: D

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9. A solution of $Na_2S_2O_3$ is standardized iodometrically against 0.1262 g of $KBrO_3$. This process required 45 mL of the $Na_2S_2O_3$ solution. What is the strength of the $Na_2S_2O_3$? (K = 39, Br = 80)

A. 0.2 M

B. 0.1 M

C. 0.05 M

D. 0.1 N

Answer: B

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10. How much volume of 0.40 M$Na_2S_2O_3$ would be required to react with the I_2 liberated by adding excess of KI of 50 mLof 0.20 M $MCuSO_4$

A. 12.5 mL

B. 25 mL

C. 50 mL

D. 2.5 mL

Answer: B

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Practice Sheet Exercise Iv Level Ii Straight Objective Type Questions

1. To a 25 ml H_2O_2 solution, excess of acidified solution of potassium iodide was added. The iodine liberated required 20 ml of 0.3 N sodium thiosulphate solution. The volume strength of H_2O_2 solution is

A. 1.344

B. 0.672

C. 2.688

D. 0.896

Answer: A

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2. Phenolphthalein is not a good indicator for titrating

A. NaOH against oxialic acid

B. NaOH against HCl

C. Ferrous sulphate against $KMnO_4$

D. NaOH against H_2SO_4

Answer: C

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3. What volume of $0.01MK_2Cr_2O_7$ would be required to oxidize Fe(II) in 50 ml of 0.03 M solution of ferrous ammonium sulphate in acidic medium?

A. 150 ml

B. 75 ml

C. 50 ml

D. 25 ml

Answer: D

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4. 40 mL of 0.05 M solution of sodium sesquicarbionate $(Na_2CO_3.\ NaHCO_3.2H_2O)$ is titrated against 0.05 M HCl solution. X ml of HCl solution is used when phenophthalein is the indicator and y ml of HCl is used when methyl orange is the indicator in two separate titrations Hence (y-x) is

A. 80mL

B. 30mL

C. 120mL

D. None of these

Answer: A

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5. In the mixture of $NaHCO_3$ and $NaCO_3$, volume of a given HCl required is x ml with phenolphathalein indicator and further y mL is required with methyl orange indicator. Hence volume of HCl for complete reaction of $NaHCO_3$ present in the original mixture is

A. 2x

B. y

C. x/2

D. (y-x)

Answer: D

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6. A 100 ml mixture of Na_2CO_3 and $NaHCO_3$ is tittrated against 1 M HCl. If v_1L and v_2L are consumed when phenolphthalein and methyl orange are used as indicators respectively in two separate titrations, which of the following is true form molarities in the original solution.

A. molarity of $Na_2CO_3 = 20v_1$

B. molarity of $NaHCO_3 = 10(v_2 - 2v_1)$

C. molarity of $Na_2CO_3 = 10(v_2 + v_1)$

D. molarity of $NaHCO_3 = 10(v_2 - v_1)$

Answer: B

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7. A mixture of Na_2CO_3 and $NaHCO_3$ having a total weight of 100 gm on heating produced 11.2L of CO_2 under STP conditions. The percentage of Na_2CO_3 in the mixture is

A. 0.558

B. 0.442

C. 0.84

D. 0.16

Answer: D

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8. 2mol $FeSO_4$ in acid medium are oxidised by x mole of $KMnO_4$, where as 2 moleof FeC_2O_4 in acid medium are oxidized by y mole of $KMnO_4$. The ratioof x and y is

A. $1/3$

B. $1/2$

C. $1/4$

D. $1/5$

Answer: A

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9. The end point of iodometic titrations is detected by adding starch just near end point and not all the beginning of titration. Which statement is not valid for this falt?

A. Starch form comple with I_2

B. Due to show decompositio of complex a diffuse end point is obtained

C. Iodometric titratic are made in strong alkaline medium where starch is either hydrolysed or decomposed

D. Iodometric titrations are made in neutral medium where starc is neither hydrolysed nor decomposed.

Answer: C

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10. Iodometric titrations are usually performed is neutral or mildlyalkaline (pH=8) or weakly acidic solution. Which statement is not vlaid for this observation?

A. In strong alkaline solution I_2 disproportinate to I^- and IO^-

B. In strong acidic solutions starch used to detect the end point tens to hydrolyse or decomposed

C. I^- produced during titration tends to be oxidised by dissolved oxygen in acidic medium.

D. Reducing power of reducing agent is increased in strong acidic medium.

Answer: D

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Practice Sheet Exercise Iv Level Ii More Than One Correct Type Questions

1. When non stoiciometric compound $Fe_{0.95}O$ is heated in presence of oxygen then it convents into Fe_2O_3. Which of the following statement is correct?

A. Equivalent weight of $Fe_{0.95}O$ is $\frac{MB}{0.5}$. Where M_B is molecular weight of $Fe_{0.95}O$

B. The number of moles of Fe^{+3} and $Fe^{+2}M$ 1 mole $Fe_{0.95}O$ are 0.1 are 0.85 respectively

C. The number of moles of Fe^{+3}, and Fe^{+2} in 1 mole of $Fe_{0.95}O$ are 0.85 and 0.1 respectively.

D. The % composition of Fe^{+2} and Fe^{+3} in the non stoichiometric compound is 89.47% and 10.53 %

Answer: B::D

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2. 40 gm NaOH, $106gmNa_2CO_3$ and $84gmNaHCO_3$ is dissolved in water and the solution is made 1 lit, 20 ml of this stock solution is titrated with 1 N HCl, hence which of the followign statements are correct?

A. The burette reading of HCl will be 40 ml, if phenolphthaleinis used as indiator from the beginning

B. The burette reading of HCkl will be 60 ml, if phenolphthalein is used as indicator form the beginning.

C. The burette readin of HCl will be 40 ml, if methy orange is used as indicator after the first end point

D. The burette reading of HCl will be 80ml, if methyl orange isused as indicator from the very beginning.

Answer: A::C::D

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3. $\begin{matrix} COOH \\ | \\ COOH \end{matrix}$ and $\begin{matrix} COOK \\ I \\ COOH \end{matrix}$ behave is acids as well as reduing agents. Then which of the following are correct statements?

A. When they have as reducing agents, then their equivalent weights are equal to half of their molecular wieghts respectively

B. 100 l of 1N solution of each is neutralized by 100 ml of $1NCa(OH)_2$

C. 1000 ml of 1N solution of each is neutralized by 1000 ml of $1Ca(OH)_2$

D. 1000 ml 1 M solution of each is neutralized by 20 mlof 2 M of $KMnO_4$ in acidic medium

Answer: A::B::D

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4. In which of the following reactions, oxygen is an oxidant?

A. $2F_2 + O_2 \rightarrow 2F_2O$

B. $C + O_2 \rightarrow CO_2$

C. $2C + O_2 \rightarrow 2CO$

D. $2N_2 + O_2 \rightarrow 2N_2O$

Answer: B::C::D

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5. Which of the following is /are correct about redox reactio?

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

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

B. The above redox reaction with the change of pH from 4 to 10 will have an effect on the strichiometry of the relation

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

D. At pH=7, $S_2O_3^{-2}$ ions are oxidised to $HSO_4^{\ominus}$

Answer: B::C::D

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6. 18 ml o 1.0 M Br_2 solution undergoes complete disproportionation in basic medium to $Br^{\ominus}$ and $Br_3^{\ominus}$. Then the resulting solution requires 45 ml of As^{+3} solutioni to reduce $BrO_3^{\ominus}$ to $Br^{\ominus}$. As^{+3} is oxidised to As^{+5} which statements are correct?

A. $E_w(Br_2) = \frac{M}{10}$

B. $E_w(Br_2) = \frac{5M}{3}$

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

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

Answer: B::C::D

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7. Which of the following relations is /are not intermolecular redox reaction?

A. $PbO_2 + H_2O \rightarrow PbO + H_2O_2$

B. $2KClO_3 \rightarrow 2KCl + 3O_2$

C. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$

D. $NH_4NO_2 \rightarrow N_2 + 2H_2O$

Answer: B::C::D

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Practice Sheet Exercise Iv Level Ii Linked Comprehension Type Questions

1. A sample of $FeSO_4.7H_2O$ crystals has been left open to the air and some of the iron (II) has been converted to iron (III). 4.2 gm of the impure crystals were dissolved in a total $250cm^3$ water and dilute sulphuric acid. $25cm^3$ portion of this solution was titrated with a solution of potenssium

bicarbonate. The concentration of dichromate (VI) ions in this solution was $0.1 \text{mol} dm^{-3}$. The averge volume used was $23.5 cm^3$ o.2 mol dm^{-3}. The average volume used to $23.5 cm^3$.

How many moles of Fe^{+2} ions would there havebeen in the $250 cm^3$ of stock solutio?

A. 7.05×10^{-4} mol

B. 2.35×10^{-4} mol

C. 1.41×10^{-2} mol

D. 7.05×10^{-4} mol

Answer: C

Watch Video Solution

2. A sample of $FeSO_4.7H_2O$ crystals has been left open to the air and some of the iron (II) has been converted to iron (III). 4.2 gm of the impure crystals were dissolved in a total $250 cm^3$ water and dilute sulphuric acid. $25 cm^3$ portion of this solution was titrated with a solution of potenssium

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What mass of Fe^{+2} ions should have been present in the 4.2 gmiof crystalsl?

A. 0.84 gm

B. 0.90 m

C. 0.77 gm

D. 0.62 gm

Answer: A

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3. A sample of $FeSO_4.7H_2O$ crystals has been left open to the air and some of the iron (II) has been converted to iron (III). 4.2 gm of the impure crystals were dissolved in a total $250 cm^3$ water and dilute sulphuric acid. $25 cm^3$ portion of this solution was titrated with a solution of potenssium

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The percentage purity of the cyrstal is

A. 0.69

B. 0.72

C. 0.88

D. 0.94

Answer: D

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4. 1.00 gm of a mixture having equal number of moles of carbonates of two alkali metals required 44.4 ml of 0.5 N HCl for complete reaction. Atomic weight of one of the metals is 7.00

The number of moles of each metal carbonate in

A. 0.1

B. 0.0111

C. 0.0055

D. 0.00275

Answer: C

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5. 1.00 gm of a mixture having equal number of moles of carbonates of two alkali metals required 44.4 ml of 0.5 N HCl for complete reaction. Atomic weight of one of the metals is 7.00

The number of moles of each metal carbonate in

A. 0.222

B. 2.22

C. 22.22

D. 0.0222

Answer: D

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Practice Sheet Exercise Iv Level Ii Matrix Matching Type Questions

1. Given two mixtures: (I) NaOH and Na_2CO_3 and (II) $NaHCO_3$ and Na_2CO_3.

100 ml of mixture I required w and x ml of 1 M HCl is separate titrations using phenophthalein and methyl orange indicators while 100 ml of mixture II required y and z ml of same HCl solutioni in separate titrations using the same indicators.

Column-I (Substance)	Column-II (Molarity in solution)
A) Na_2CO_3 in mixture I	P) $(2w - x) \times 10^{-2}$
B) Na_2CO_3 in mixture II	Q) $(z - 2y) \times 10^{-2}$
C) NaOH in mixture I	R) $y \times 10^{-2}$
D) $NaHCO_3$ in mixture II	S) $(x - w) \times 10^{-2}$

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Practice Sheet Exercise Iv Level Ii Integer Type Questions

1. The volume of 0.1 M NaOH will be required to neutralise 100 ml of 0.1 ml H_3PO_4 using methyl red indicator to change the colour from pink (acidic medium) to yellow (basic medium) is 10^x. What is x?

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2. The purity of H_2O_2 in a given sample is 85%. The weight of impure sample of H_2O_2 which required 10 ml of $M/5KMnO_4$ solution in a titration in acidic medium is 0.1 x. Find x?

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3. 0.4 gm of polybasic acid H_nA (M.wt = 96) requires 0.5 gm NaOH for complete neutralisation. The number of replacable hydorgen atoms are (all the hydrogens are acidic)

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4. 0.31 gm of an ally Fe+ Cu was dissolved in excen dilute H_2SO_4 and the solution was made up to 100 ml . 20 ml of this soltin required 3 m of $\frac{N}{30}K_2Cr_2O_7$ solution for exact oxidation. The % purity (in closest value) of Fe in wire is _____.

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5. The oxidation state of mobdenum in $\left[MO_2O_4(C_2H_4)_2H_2O_2\right]^{-2}$ is _____

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6. 4.48 lit of ammonia at STP is neutralised using 100 ml of a solution of H_2SO_4, the molarity of acid is

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Additional Practice Exercise Level I Main Straight Objective Type Questions

1. A 2 lit solution contains 0.04 mol of each of $\left[CO(NH_3)_5SO_4\right]Br$ and $\left[CO(NH_3)_5Br\right]SO_4$. To 1 lit of this solution, excess of $AgNO_3$ is added. To the remaining solution of excen of $BaCl_2$ is added. The amounts of precipitated salts, respectively, are

A. 0.01 mol & 0.01 mol

B. 0.01 mol & 0.02 mol

C. 0.02 mol & 0.01 mol

D. 0.02 mol & 0.02 mol

Answer: D

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2. The value of n in the molecular formula Ben $Al_2Si_6O_{18}$ is _____

A. 2

B. 3

C. 4

D. 5

Answer: B

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3. Dissolving 120 gm of urea in 100 gm of water gave a solution of density $1.15 gm \text{lit}^{-1}$. The molarity of the solution is

A. 1.78 M

B. 2.50 M

C. 2.05 M

D. 2.22 M

Answer: C

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4. To neutralize compltely 20 ml of 0.1 M aqueous solution of phosphorus acid, the volume of 0.1 molal aqueous KOH solution required is

A. 10 ml

B. 60 ml

C. 40 ml

D. 20 ml

Answer: C

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5. If we consider that 1/6 in place of 1/12 mass of carbon is taken to be the relation atomic mass unit, the mass of one mole of substance will

A. Decrease twice

B. Increase two fold

C. remain unchanged

D. be a function of the molecular men of the substance

Answer: A

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6. Density of a 2.05 M solution of acetic acid in waer is 1.02 gas ml^{-1}. The molarity of the solution si

A. $1.14 \text{mol} kg^{-1}$

B. $3.28 \text{mol} kg^{-1}$

C. $2.28 \text{mol} kg^{-1}$

D. $0.44 \text{mol} kg^{-1}$

Answer: C

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7. HgO is analysed by reaction with iodide and them titrating with an acid. The equivalent mass of HgO is

$$H_2O + HgO + 4I^- \rightarrow HgI_4^{-2} + 2OH^-$$

A. molarity of $Na_2CO_3 = 20v_1$

B. M/2

C. M/4

D. M/3

Answer: B

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8. Which question represents charge because equation for the solution of H_2S in water?

A. $[H^+] = 2[S^{-2}] + [HS^-] + [OH^-]$

B. $[H^+] = [OH^-]$

C. $[H^+] = [S^{-2}] + [HS^-] + [H^+]$

D. $[H^+] = [S^{-2}] + [HS^-] + [OH^-]$

Answer: A

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9. The ionic strength of solution containing 0.5 M $MgSO_4 0.1 M AlCl_3$ and $0.2(NH_4)_2SO_4$ is

A. 0.75

B. 1.85

C. 3.2

D. 1.5

Answer: C

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10. The percentage of CH_2O in $CuSO_45H_2O$ is

A. zero

B. about 28.7

C. about 50

D. about 40

Answer: B

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11. 112% labelled oleum is diluted with sufficient water. The solution on mixing with $5.3 \times 102gmNa_2CO_3$ liberates CO_2. The volume of Co_2 given out at 1 atm at 273 K will be

A. 1.12 litres

B. 1.23 lit

C. 2.2 lit

D. 37.75 lit

Answer: D

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12. What is the specific volumeof costor or its density is $956kgm^{-3}$?

A. $1.05 \times 10^{-3}kgm^{-3}$

B. $1.05 \times 10^{-3}m^{3}kg^{-3}$

C. $1.25 \times 10^{-3}kg^{-1}$

D. $9.56 \times 10^{-3}kgm^{-3}$

Answer: B

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13. The number of significant figures in each of these given numbers respectively are

(i) 506.20 (ii) 0.003402

A. 4,5

B. 4,4

C. 5,4

D. 5,6

Answer: C

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14. Number of atoms of iron present in 100 gm Fe_2O_3 having 20% purity is

A. $0.2N_A$

B. $0.25N_A$

C. $0.5N_A$

D. $0.3N_A$

Answer: B

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15. Which mixture is lighter than humid air?

A. $N_2 + O_2 + SO_2$

B. $N_2 + O_2 + CO_2$

C. $N_2 + O_2 + C_2H_6$

D. $N_2 + O_2 + HC$

Answer: D

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Additional Practice Exercise Level Ii Lecture Sheet Advanced Straight Objective Type Questions

1. A solid element has specific heat $1Igm^{-1}k^{-1}$. If the equivalent weight of the element is 9. Identify the valency and atomic weight of element.

A. 2,6

B. 2,37

C. 9,28

D. 5,27

Answer: B

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2. 12.8 gm of an organilc compound containing C_1H_1O and undergoes combustion to produce 25.56 gm CO_2 and 10.46 gm of H_2O. What is the empirical formula of compound.

A. CH_2O_2

B. CH_2O

C. C_2H_4O

D. CHO

Answer: C

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3. Inniting MnO_2 in air converts it quantitctively to Mn_3O_4. A sample of pyrolusite is of the following composition. $MnO_2 = 80\,\%$ and othe inert constituents =15% and rest bearing H_2O. The sample is ignited to constant weight. What is the % of Mn is the igrited sample.

A. 0.594

B. 0.55

C. 0.568

D. 0.586

Answer: A

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4. NaoH and Na_2CO_3 are dissolved in 200 ml aqeous solution. In the presence of phenolpthaleim indicator, 17.5 ml of 0.1 HCl are used to titrated this solution. Now methyl orange is added in the same solution titrated and requires 2.5 ml of the same HCl. Calculate the normality of NaOH & $NaCO_3$.

A. $0.5, \frac{1.5}{200}$

B. $\frac{1.5}{200}, 0.5$

C. 0.5,0.5

D. $1.5, 1.5$

Answer: B

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5. 20 gm of sample $Ba(OH)_2$ is dissolved in 10 ml of 0.5 N HCl solution, The excess of HCl was titrated with 0.2 NaOH. The volume of NaOh used was 10 mol. Calculate the % of $Ba(OH)_2$ in the sample.

A. 0.015

B. 2.6

C. 0.034

D. 0.013

Answer: D

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6. 1.9 8m of a sample of H_2O_2 solution containing y% H_2O_2 be weight requires y ml of $KMnO_4$ solution for complete titration under acidic condition. Find the molarity of $KMnO_4$ solution

A. 0.2 M

B. 0.11 M

C. 0.011 M

D. 0.25 M

Answer: B

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7. A sample of pynolusite (MnO_2) weights 0.5 gm. To this solutioin 0.594 gm As_2O_3 and a dilute acid are added. After the reaction has stopped As^{+3} is AS_2O_3 is titrated with 45 mlof M/50 KMn_4 solution. Calculate the percentage of MnO_2 in pyrolusite.

A. 0.6225

B. 0.68

C. 0.673

D. 0.666

Answer: A

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8. A sample of H_2O_2 is x % by mass. If x ml of $KMnO_4$ are required to oxidize 1 gm of this H_2O_2 sample, calculate the normality of $KMnO_4$ solution.

A. 0.46 N

B. 0.5 N

C. 0.6 N

D. 0.65 N

Answer: C

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9. 50 ml solution of H_2O_2 was treated with excess KI (s) and the solution was acidified with acetic acid. The liberated I_2 required 40 ml of $0.5MNa_2S_2O_3$ solution for the end point using starch is indicator. Find the molairty and volume strength of the H_2O_2 solution.

A. 1.12 gm lit

B. 2.24 gm/lit

C. 5.6 gm/lit

D. None of these

Answer: B

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10. The density of a 3.6 MH_2SO_4 solution that is 29% H_2SO_4 by mass will be

A. $0.212gmML^{-2}$

B. $0.122 gm Ml^{-1}$

C. $2.12 gm Ml^{-1}$

D. $1.22 gm Ml^{-1}$

Answer: D

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Additional Practice Exercise Level Ii Lecture Sheet Advanced More Than One Correct Answer Type Questions

1. Equal volumes of 0.1 M KCl and 0.1 $MFeCl_3$ are mixed with no change in volume, which is/are correct?

A. $\left[Fe^{+3}\right] = 0.05M$

B. $\left[K^{+}\right] = 0.05M$

C. $\left[Cl^{-}\right] = 0.2M$

D. $\left[Cl^{-}\right] > \left[K^{+}\right]$

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

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2. When 4 gm of Mg burnt with O_2 form oxide and on dilution of metal oxide form metal hydroxide which statement is/are correct for above series of reaction?

A. Gram quvalent of metal, metal oxide and metal hydroxide are equal

B. Weight of metal oxide is 6.66 gm

C. Weight of metal hydroxide is 9.66 gm

D. Normaililty of solutioni in 1 litre volume is $\frac{14}{42}$

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

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3. Choose the correct match

A. 18ml H_2O at $4^\circ C$ contains 6.023×10^{24} electrons

B. 11200 mklof CO_2 at STP contatins $6.023 \times x10^{23}$ oxygen atom.

C. 5600 ml of CH_4 at 273 K and 2 atm contains 12.04×10^{23} hydrogen atom

D. 5600 ml of CH_4 at STP contains 1.505×10^{23} methane molecules.

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

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4. PF_3 reacts with XeF_4 to give PF_5

$$\underset{(g)}{2PF_3} + \underset{(s)}{XeF_4} \rightarrow \underset{(g)}{2PF_5} + \underset{(g)}{Xe}$$

If 100.0gm of PF_3 and 50.0 gm XeF_4 react, then which of the following statement is true?

A. XeF_4 is the limiting reagent

B. PF_3 is the limiting reagent

C. 1.127 mol of PF_5 are produced

D. 0.382 mol of PF_5 are produced

Answer: A::D

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5. The reaction $2\underset{(aq)}{ClO^{\ominus}} \rightarrow 2\underset{(aq)}{Cl^{\ominus}} + 2\underset{(aq)}{Cl^{-}}$ is an example of

A. oxiclatio reaction

B. Reduction reaction

C. Disproportionation reaction

D. Decomposition reaction

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

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Additional Practice Exercise Level Ii Lecture Sheet Advanced Linked Comprehension Type Questions

1. Iodine titration can be iodemotric or iodimetric depending on using iodine directly or indirectly is an oxidising agent in the redox titration.

a. Iodimetric titration in which a standard iodine solution is used as an oxidant and iodine is directly or indirectly titrated against a reducing agent. For example.

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

b. Iodimetric procedures are used for the datermination of strength of reducing agent such as thiosulphates, sulphites, arsenties adn stanous chloride etc. by titrating them against standard solution of iodine in a burette.

$2Na_2SO_3 \rightarrow 2NaI + Na_2S_4O_6$

Starch is used as indicator near the end point whilch form blue colour complex with I_3^-. The blue colour disappeams when there is not more of free I_2.

The volume of KI solutioin used for $CuSO_4$ will be

A. $M/8$

B. $M/4$

C. $M/2$

D. M

Answer: D

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2. Iodine titration can be iodemotric or iodimetric depending on using iodine directly or indirectly is an oxidising agent in the redox titration.

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complex with I_3^-. The blue colour disappeams when there is not more of free I_2.

When 319.0 gm of $CuSO_4$ in a solution is related with excess of 0.5 M KI solution, then librated iodine required 200 ml of $1.0MNa_2S_2O_3$ for complete relation. The percentage purity of $CuSO_4$ in the sample is

A. 0.1

B. 0.2

C. 0.05

D. None of these

Answer: C

Watch Video Solution

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The volume of KI solutioin used for $CuSO_4$ will be

A. 100 ml

B. 40 ml

C. 400 ml

D. 200 ml

Answer: D

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4. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The affectiveness of bleach solution is often measured by iodometry.

25 ml of household bleach solution was mixed with 30 ml of 0.5 M KI and 10 ml of 4 N acetic acid. In the titratio of the liberated iodine, 48 mlof 0.25 N Na_2SO_3 wasused to reach the end point. The moalirty of the household bleach solution is

A. 0.48 N

B. 0.96 M

C. 0.24 M

D. 0.024 M

Answer: C

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5. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The affectiveness of bleach solution is often measured by iodometry.

Bleaching powder contains a slat of an oxacid as one of its components. The anlydride of that oxoacid is

A. Cl_2O

B. Cl_2O_7

C. ClO_2

D. Cl_2O_6

Answer: A

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Additional Practice Exercise Level Ii Lecture Sheet Advanced Matrix Matching Type Questions

1. Match the concentration terms with the factors affecting the concentration.

Column-I	Column-II
A) Moalrity (M)	P) Temperature
B) Molality (m)	Q) Pressure
C) Mole fraction (X)	R) Dilution
D) Normality	S) Volume

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2. Experiment determination of molar mass of compounds may be made by the following methods. Match them property.

Column-I	Column-II
A) Gases	P) Vector meyer's method
B) Volatice solids	Q) Hofmann's method
C) Non-volatice solids	R) Duma's method
D) Solids of low molar mass	S) Ebullioscopy or cryoscopy
E) Solids of high molar mass such as polymers	T) Osmotic pressure
	U) Raoult's law

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Additional Practice Exercise Level Ii Lecture Sheet Advanced Integertype Questions

1. The volume (in ml) of 0.10 M $AgNO_3$ required for complete precipitation of chlorine ions present in 30 ml of 0.01 M solution of $\left[Cr(H_2O)_5Cl\right]Cl_2$ as silver chlorine is close to _____

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2. A sample of crystalline $Ba(OH)_2.XH_2O$ weight 1.578 gm was dissolved in water. The solution required 40 ml of $0.25NHNO_3$ for complete relation. Determine the number of molecular of water of crystallisat in base.

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3. Compound S_4N_4 decompose completely into $S_{X(g)}$ and $N_{2(g)}$. If all measurements are made at same P & T each volume of S_4N_4 gives 4.0 volume of gaseous product. The value of X is_____

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4. 500 ml of aM and 500 ml of bM solution of a solute are mixed and diluted to 2 litre to prepare a solution of 1.5 M. If a and b are in the ratio 2 : 1, then the value of a is.

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5. A student performs a titration with different buretts and fins titre value of 25.2 ml, 2.25 ml, 25.0 ml. The number of significant figures in the average titre value i.

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Practice Sheet Advanced Straight Objective Type Question

1. What weight of slaked lime will be required to decompose completely 4 grams ammonium chloride

A. 2.77 g

B. 3.5 g

C. 5.5 g

D. 5.44 g

Answer: B

2. A certain weight of sodium Iodine and sodium chloride mixture when treated with sulphuric acid was found to give the same weight (as that of mixture) of sodium sulphate. The percentage composition of NaCl is

A. 18.86

B. 52.23

C. 35.57

D. 71.14

Answer: D

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3. How may gram of 83.4% pure sodium sulphate can be produced form 250 g of 95% pure NaCl.

A. 288.2 g

B. 237.5 g

C. 345.4 g

D. 187.2 g

Answer: C

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4. To a 25 ml H_2O_2 solution, excess of acidified solution of potassium iodide was added. The iodine liberated required 20 ml of 0.3 N sodium thiosulphate solution. The volume strength of H_2O_2 solution is

A. 0.672

B. 1.344

C. 2.688

D. 0.896

Answer: B

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5. 20 CC of hydro carbon were exploded with excess of oxygen. After explosion and cooling a contracting of was noted on addition of KOH another contraction of 40 CC was noted. The molecular formula of hydrocarbon is

A. C_2H_6

B. C_2H_4

C. C_2H_2

D. CH_4

Answer: C

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6. 10 ml of a mixture of carbon monoxide, march gas and hydrogen exploded with excess of oxygen gave a contraction of 6.5 CC/. There was further contraction of 7 CC when the residual gas was treated with canstic potash. The volume of march gas present in original mixture as

A. 5CC

B. 2CC

C. 3CC

D. 4CC

Answer: B

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7. On gram of the carbonate of a metal was dissolve din 35 CC 1N HCl.The resulting liquid required 50 CC $\frac{N}{10}$ caustic soda solution to neutralise it completely. The equivalent weight of metal carbonate is

A. 100

B. 25

C. 53

D. 50

Answer: D

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8. A small amount of $CaCO_3$ completely neutralises 525 ml of $\frac{N}{10}$ HCl and no acid is left at the end after converting all calcium chloride to $CaSO_4$. How much plaster paris $\left(CaSO_4\frac{1}{2}H_2O\right)$ can be obtained

A. 1.916 g

B. 5.827 g

C. 7.53 g

D. 3.81 g

Answer: D

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9. An element A forms a chloride which contains 29.34% by weight of chloride and is isomorphous with KCl. The atomic weight of A is

A. 85.49

B. 40

C. 23

D. 137.5

Answer: A

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10. Air contains 21% oxygen by weight. What weight of air is required t burn 200 g of coal which contains only 80% combustible material

A. 2031.79

B. 1023.5g

C. 426.6g

D. 160g

Answer: A

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Practice Sheet Advanced More Than One Correct Answer Type Question

1. Pevoxy linkage is present in

A. CrO_5

B. Caros' acid

C. Marshall's acid

D. Pernetric acid

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

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2. Pick out correct statements

A. One gram equivalent of xoygen at STP occupies 5.6 litres

B. The molarity of 10 volume H_2O_2 is 0.89 M

C. Phenolphthalien indulator indicates only half neutralisation of Na_2CO_3

D. Empirical formula of benczenr in CH

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

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3. Pick out correct statements

A. Equivalent weight of an element will change with valency

B. In 109% H_2SO_4 labeled oleu in the percent of free SO_3 is 60%

C. Metathesis reaction are redo reaction

D. Product of volume in ml and normality of solution gives number of milliequivalent of solute

Answer: A::D

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4. Pick out incorrect statements

A. The volume of $0.1MFeC_2O_4$ solution required to reduce 200 ml of $0.6MK_2Cr_2O_7$ in acidic medium is 2400 ml

B. The volume of $0.1MCa(OH)_2$ required to neutralise $0.2MH_3PO_3$ solution of volume $0.25dm^3$ is 500 ml

C. Equivalent weight of sulphate ion is 49

D. Molality of enfluenced by change in temperature

Answer: C::D

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5. The correct statements are

A. The isotopies of chlorine with mass number 35 and 37 exist in ratio 3:21 if its average atomic mass is 35.5

B. The mass of one amu is approximately $1.6 \times 10^{-24}g$

C. The number of molecules in 1 ml of gas at STP is called Loschmidt number

D. If 6.023×10^{21} molecules of a solute are present in 100 ml solution

molarity of solution is 0.1 M

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

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Practice Sheet Advanced Linked Comprehension Type Question

1. Two formulal to calculate number of milli equivalkents (mlQ)

Numbr of miliequivalents $= \frac{\text{weight}}{\text{GEW}} \times 1000$

Numbr of milliequivalents= volume in ml $\times$ Normality of solution

0.09 grams of dibasic acid neutralise 40 ml of $\frac{N}{20}$ NaOH solution. Molecular weight of acid is

A. 90

B. 45

C. 180

D. 60

Answer: A

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2. Two formulal to calculate number of milli equivalents (mlQ)

Numbr of miliequivalents $= \frac{\text{weight}}{\text{GEW}} \times 1000$

Numbr of milliequivalents= volume in ml $\times$ Normality of solution

0.25 grams of pure $CaCO_3$ neutralised 25 ml dilue HCl normality of HCl solution is

A. 0.1 N

B. 0.5 N

C. 0.25 N

D. 0.2 N

Answer: D

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Practice Sheet Advanced Matrix Matching Type Question

1. Match the following columns

Column-I	Column-II
A) 22.4 volume H_2O_2	P) 11.2 litres
B) 32 g oxygen	Q) 9.034×10^{23} atoms
C) 11.2 L CO_2 at STP	R) 2 mole L^{-1}
D) 1 gram equivalent hydrogen at STP	S) 9.64×10^{24} electron

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Practice Sheet Advanced Integer Type Question

1. Ammonia is oxised by oxygen to give nitric oxide and water. The weight of water produced per gram of nitric oxide is $0.1 \times xg$. What is value of d.

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2. One gram limestone is heated and quickline so formed is dissolved in one litre of water. The normality of solution is $0.01 \times x$.What is value of x.

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