

SUBJECT : CHEMISTRY
SECTION - A

51. 'Spin only' magnetic moment is same for which of the following ions?

- A. Ti^{3+} B. Cr^{2+}
 C. Mn^{2+} D. Fe^{2+}
 E. Sc^{3+}

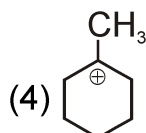
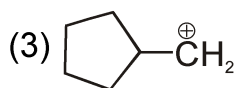
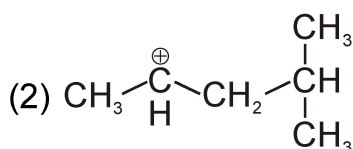
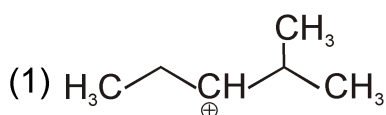
Choose the most appropriate answer from the options given below :

- (1) B and D only
 (2) A and E only
 (3) B and C only
 (4) A and D only

Ans. (1)

Sol. Cr^{+2} and Fe^{+2} have same spin only magnetic moment because both have four unpaired electron.

52. The most stable carbocation among the following is :



Ans. (4)

Sol. $\alpha\text{-H} \uparrow \Rightarrow \text{Stability} \uparrow$

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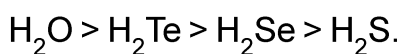
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53. Given below are two statements :

Statement-I : The boiling point of hydrides of group 16 elements follows the order



Statement-II : On the basis of molecular mass, H_2O is expected to have lower boiling point than the other members of the group but due to the presence of extensive H-bonding in H_2O , it has higher boiling point.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) Both Statement I and Statement II are true.
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II are false.
- (4) Statement I is false but Statement II is true.

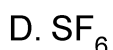
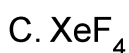
Ans. (1)

Sol. Boiling point $\Rightarrow \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{O}$
 $\underbrace{\hspace{10em}}_{\text{B.Pt } \alpha\text{-vanderwall force}} \quad \underbrace{\hspace{2em}}_{\text{Highest B.Pt due to strong H-bonding}}$

54. Match List-I with List-II.

List-I

(Compound)



List-II

(Shape/geometry)

I. Trigonal Pyramidal

II. Square Planar

III. Octahedral

IV. Square Pyramidal

Choose the correct answer from the options given below :

(1) A-I, B-IV, C-II, D-III

(2) A-II, B-IV, C-III, D-I

(3) A-III, B-IV, C-I, D-II

(4) A-II, B-III, C-IV, D-I

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57. Match List-I with List-II.

List-I**(Process)**

- A. Isothermal process
- B. Isochoric process
- C. Isobaric process
- D. Adiabatic process

List-II**(Condition)**

- I. No heat exchange
- II. Carried out at constant temperature
- III. Carried out at constant volume
- IV. Carries out at constant pressure

Choose the correct answer from the options given below :

(1) A-IV, B-III, C-II, D-I

(2) A-IV, B-II, C-III, D-I

(3) A-I, B-II, C-III, D-IV

(4) A-II, B-III, C-IV, D-I

Ans. (4)

Sol. Isothermal process ($T = \text{constant}$)

Isochoric process ($V = \text{constant}$)

Isobaric process ($P = \text{constant}$)

Adiabatic process ($q = 0$)

58. Which one of the following alcohols reacts instantaneously with Lucas reagent?

(1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{OH}$

(2) $\text{CH}_3\text{-CH}_2\text{-CH(OH)-CH}_3$

(3) $\text{CH}_3\text{-CH(CH}_3\text{)-CH}_2\text{OH}$

(4) $\text{CH}_3\text{-C(CH}_3\text{)}_2\text{-OH}$

Ans. (4)

Sol. Reactivity towards lucas reagent $\rightarrow 3^\circ > 2^\circ > 1^\circ$ (alcohol)

59. In which of the following equilibria, K_p and K_c are **not** equal?

(1) $\text{PCl}_{5(g)} \rightleftharpoons \text{PCl}_{3(g)} + \text{Cl}_{2(g)}$

(2) $\text{H}_{2(g)} + \text{I}_{2(g)} \rightleftharpoons 2\text{HI}_{(g)}$

(3) $\text{CO}_{(g)} + \text{H}_2\text{O}_{(g)} \rightleftharpoons \text{CO}_{2(g)} + \text{H}_2_{(g)}$

(4) $2 \text{BrCl}_{(g)} \rightleftharpoons \text{Br}_{2(g)} + \text{Cl}_{2(g)}$

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**Ans. (1)****Sol.** (i) $\Delta n_g = 1$ Hence $K_c \neq K_p$ Rest all options has $\Delta n_g = 0$ so, $K_p = K_c$ for them.

60. Match List-I with List-II.

List-I**Quantum Number**A. m_ℓ B. m_s C. l D. n **List-II****Information provided**

I. Shape of orbital

II. size of orbital

III. Orientation of orbital

IV. Orientation of spin of electron

Choose the correct answer from the options given below :

(1) A-I, B-III, C-II, D-IV

(2) A-III, B-IV, C-I, D-II

(3) A-III, B-IV, C-II, D-I

(4) A-II, B-I, C-IV, D-III

Ans. (2)**Sol.** m_ℓ Orientation of orbital m_s Orientation of spin of electron l Shape of orbital n size of orbital

61. Given below are two statements :

Statement-I : Aniline does not undergo Friedel-Crafts alkylation reaction.**Statement-II** : Aniline cannot be prepared through Gabriel synthesis.In the light of hte above statements, choose the **correct** answer fromthe options given below:

(1) Both Statement I and Statement II are true.

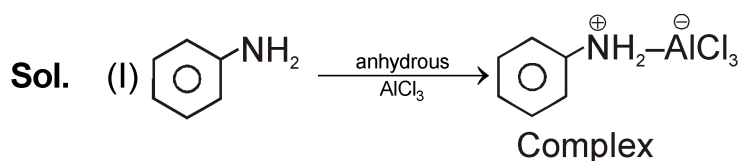
(2) Both Statement I ad Statement II are false

(3) Statement I is true but Statement II are false.

(4) Statement I is false but Statement II is true.

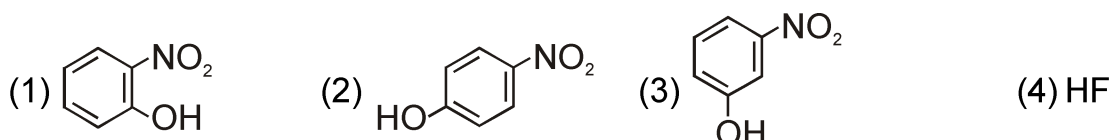
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Ans. (1)

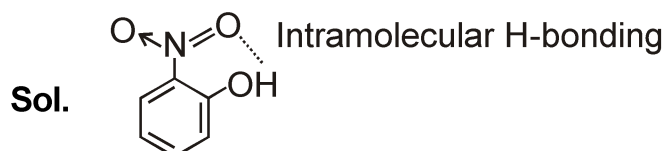


(II) Only aliphatic 1° -amine prepared through gabriel synthesis.

62. Intramolecular hydrogen bonding is present in :



Ans. (1)



63. On heating, some solid substances change from solid to vapour state without passing through liquid state. The technique used for the purification of such solid substances based on the above principle is known as :

- (1) Crystallization (2) Sublimation
(3) Distillation (4) Chromatography

Ans. (2)

Sol. Theoretical

64. In which of the following processes entropy increases?

- A. A liquid evaporates to vapour.
B. Temperature of a crystalline solid lowered from 130 K to 0 K.
C. $2 \text{NaHCO}_{3(s)} \rightarrow \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}$
D. $\text{Cl}_{2(g)} \rightarrow 2\text{Cl}_{(g)}$

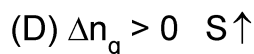
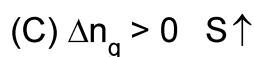
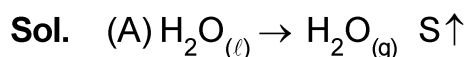
Choose the correct answer from the options given below :

- (1) A and C (2) A, B and D (3) A, C and D (4) C and D

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**Ans. (3)**65. Among group 16 elements, which one does **NOT** show -2 oxidation state?

(1) O

(2) Se

(3) Te

(4) Po

Ans. (4)**Sol.** In p-block electronegativity is decreases down the group so stability of negative oxidation state decreases in the group.Stability of -2 oxidation state in group 16 – \Rightarrow Polonium least stable, so does not show -2 oxidation state.

66. Match List-I with List-II.

List-I**(Conversion)**A. 1 mol of H_2O to O_2 B. 1 mol of MnO_4^- to Mn^{2+} C. 1.5 mol of Ca from molten CaCl_2 D. 1 mol of FeO to Fe_2O_3

(1) A-II, B-IV, C-I, D-III

(3) A-II, B-III, C-I, D-IV

List-II**(Number of Fraday reuiired)**

I. 3F

II. 2F

III. 1F

IV. 5F

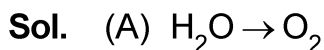
(2) A-III, B-IV, C-I, D-II

(4) A-III, B-IV, C-II, D-I

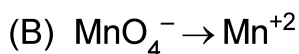
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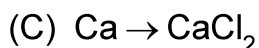
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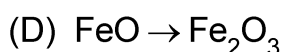
$$n.f = 2 \quad \text{charge} = 2F$$



$$n.f = 5 \quad \text{charge} = 5F$$



$$n.f = 2 \quad \text{charge} = 2F \times 1.5 = 3F$$



$$n.f = 1 \quad \text{charge} = F$$

67. Arrange the following elements in increasing order of electronegativity :

N, O, F, C, Si

Choose the correct answer from the options given below :

(1) $\text{Si} < \text{C} < \text{N} < \text{O} < \text{F}$

(2) $\text{Si} < \text{C} < \text{O} < \text{N} < \text{F}$

(3) $\text{O} < \text{F} < \text{N} < \text{C} < \text{Si}$

(4) $\text{F} < \text{O} < \text{N} < \text{C} < \text{Si}$

Ans. (1)

Sol. Electronegativity increases in period from left to right due to increase the effective nuclear charge and it decreases in group.

$$\text{EN} \rightarrow \text{Si} < \text{C} < \text{N} < \text{O} < \text{F}$$

68. A compound with a molecular formula of C_6H_{14} has two tertiary carbons. Its IUPAC name is:

(1) n-hexane

(2) 2-methylpentane

(3) 2,3-dimethylbutane

(4) 2,2-dimethylbutane

Ans. (3)



Sol. $\text{CH}_3-\overset{\text{CH}_3}{\underset{|}{\text{CH}}}-\overset{\text{CH}_3}{\underset{|}{\text{CH}}}-\text{CH}_3$, 2,3-dimethyl butane

69. Fehling's solution 'A' is

- (1) aqueous copper sulphate
- (2) alkaline copper sulphate
- (3) alkaline solution of sodium potassium tartrate (Rochelle's salt)
- (4) aqueous sodium citrate

Ans. (1)

Sol. Theoretical

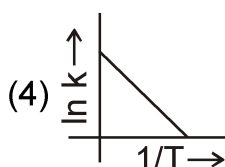
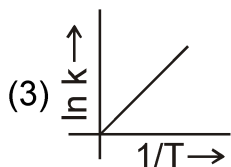
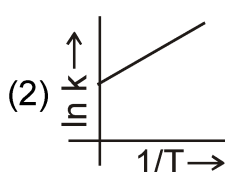
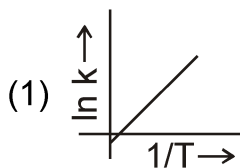
70. Activation energy of any chemical reaction can be calculated if one knows the value of

- (1) rate constant at standard temperature
- (2) probability of collision
- (3) orientation of reactant molecules during collision
- (4) rate constant at two different temperatures.

Ans. (4)

Sol.
$$\log\left(\frac{K_2}{K_1}\right) = \frac{E_a}{2.303R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

71. Which plot of $\ln k$ vs $1/T$ is consistent with arrhenius equation?



Ans. (4)

Sol. $k = Ae^{-E_a/RT}$

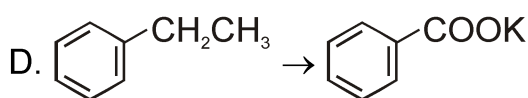
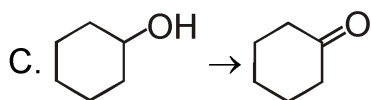
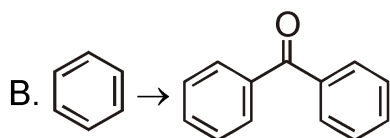
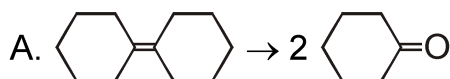
$$\ln k = \ln A - \frac{E_a}{RT}$$

$$\ln k \text{ vs } \frac{1}{T} \text{ graph has slope (m)} = -\frac{E_a}{R}$$

72. Match List-I with List-II.

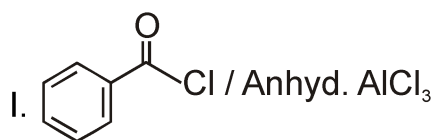
List-I

(Reaction)



List-II

(Reagents/condition)



II. CrO_3

III. $\text{KMnO}_4 / \text{KOH}, \Delta$

IV. (i) O_3 , (ii) $\text{Zn-H}_2\text{O}$

Choose the correct answer from the options given below :

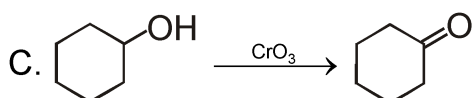
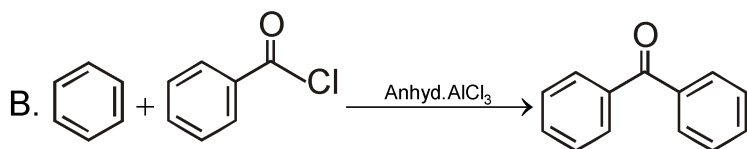
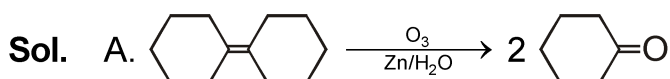
(1) A-IV, B-I, C-III, D-II

(2) A-III, B-I, C-II, D-IV

(3) A-IV, B-I, C-II, D-III

(4) A-I, B-IV, C-II, D-III

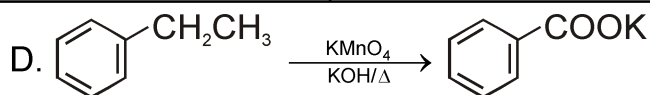
Ans. (3)



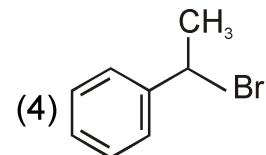
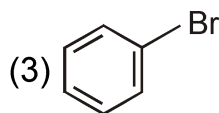
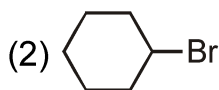
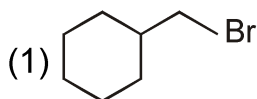
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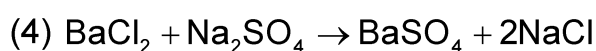
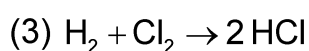
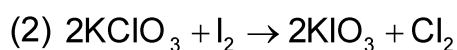
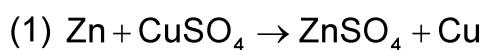
73. The compound that will undergo $\text{S}_{\text{N}}1$ reaction with the fastest rate is



Ans. (4)

Sol. Stability of carbocation \propto $\text{S}_{\text{N}}1$ reactivity

74. Which reaction is NOT a redox reaction?



Ans. (4)

Sol. $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$

Oxidation number of any element does not change so it is non-redox reaction.

75. Given below are two statements:

Statement I: The boiling point of three isomeric pentanes follows the order

n-pentane > isopentane > neopentane

Statement II : When branching increases, the molecule attains a shape of sphere. This results in smaller surface area for contact, due to which the intermolecular forces between the spherical molecules are weak, thereby lowering the boiling point.

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

(1) Both Statement I and Statement II are correct,

(2) Both Statement I and Statement II are incorrect.

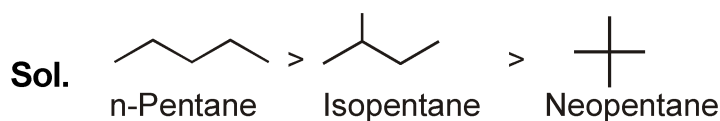
(3) Statement I is correct but Statement II is incorrect.

(4) Statement I is incorrect but Statement II is correct.

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**Ans. (1)**

On increasing branching \rightarrow surface area \downarrow \rightarrow inter molecular force of attraction \downarrow \rightarrow BP \downarrow

76. Given below are two statements :

Statement I : Both $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{CoF}_6]^{3-}$ complexes are octahedral but differ in their magnetic behaviour.

Statement II : $[\text{Co}(\text{NH}_3)_6]^{3+}$ is diamagnetic whereas $[\text{CoF}_6]^{3-}$ is paramagnetic.

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

- (1) Both Statement I and Statement II are true.
- (2) Both Statement I and Statement II are false.
- (3) Statement I is true but Statement II is false.
- (4) Statement I is false but Statement II is true.

Ans. (1)

Sol. $[\text{Co}(\text{NH}_3)_6]^{3+}$ -due to presence of strong field ligand " NH_3 " all six electrons get paired up and it become diamagnetic

$[\text{CoF}_6]^{3-}$ - due to Presence of weak field ligand " F^- " pairing not occurs and Co^{+3} have four unpaired electrons and it is paramagnetic



77. Match List I with List II.

List I**(Molecule)**

A. ethane

B. ethene

C. carbon

molecule, C₂

D. ethyne

List II**(Number and types of bond/s between two carbon atoms)**I. one σ -bond and two π -bondsII. two π -bondsIII. one σ -bondIV. One σ -bond and one π -bond

Choose the correct answer from the options given below:

(1) A-I, B-IV, C-II, D-III

(2) A-IV, B-III, C-II, D-I

(3) A-III, B-IV, C-II, D-I

(4) A-III, B-IV, C-I, D-II

Ans. (3)

Sol.	Molecule	Structure	types of bonds between carbons
	ethane	CH ₃ -CH ₃	one σ -bond
	ethene	CH ₂ =CH ₂	one σ + one π - bond
	Carbon molecule	C = C	two π -bonds
	ethyne	CH \equiv CH	one σ + two π -bonds

78. The Henry's law constant (K_H) values of three gases (A, B, C) in water are 145, 2×10^{-5} and 35 kbar, respectively. The solubility of these gases in water follow the order:

(1) B > A > C

(2) B > C > A

(3) A > C > B

(4) A > B > C

Ans. (2)

Sol. $K_H \propto \frac{1}{\text{solubility}}$; K_H order A > C > B

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79. The energy of an electron in the ground state ($n = 1$) for He^+ ion is $-x$ J, then that for an electron in $n = 2$ state for Be^{3+} ion in J is :

- (1) $-x$ (2) $-\frac{x}{9}$ (3) $-4x$ (4) $-\frac{4}{9}x$

Ans. (1)

Sol.
$$\frac{E_1}{E_2} = \frac{Z_1^2}{n_1^2} \times \frac{n_2^2}{Z_2^2}$$

$$\frac{-x}{E_2} = \frac{2^2}{1^2} \times \frac{2^2}{4^2} = 1$$

$$E_2 = -x$$

80. The E° value for the $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is more positive than that of $\text{Cr}^{3+}/\text{Cr}^{2+}$ or $\text{Fe}^{3+}/\text{Fe}^{2+}$ due to change of

- (1) d^5 to d^4 configuration (2) d^5 to d^2 configuration
(3) d^4 to d^5 configuration (4) d^3 to d^5 configuration

Ans. (3)

Sol. E° value for the $\text{Mn}^{3+}/\text{Mn}^{2+}$ is more positive it means it is oxidising agent and have tendency to convert in less stable d^4 configuration to more stable d^5 configuration.

81. The reagents with which glucose does not react to give the corresponding tests/products are

- A. Tollen's reagent B. Schiff's reagent
C. HCN D. NH_2OH E. NaHSO_3

Choose the correct options from the given below:

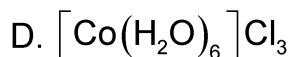
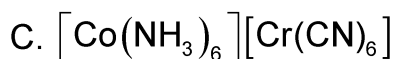
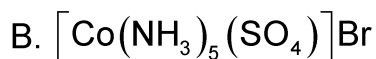
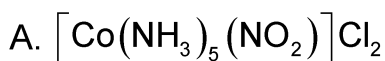
- (1) B and C (2) A and D (3) B and E (4) E and D

Ans. (3)

Sol. Theoretical



82. Match List I with List II.

List I (Complex)**List II (Type of isomerism)**

I. Solvate isomerism

II. Linkage isomerism

III. Ionization isomerism

IV. Coordination isomerism

Choose the correct answer from the options given below:

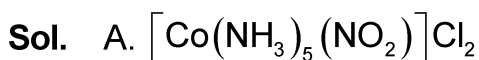
(1) A-II, B-III, C-IV, D-I

(2) A-I, B-III, C-IV, D-II

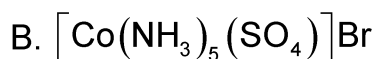
(3) A-I, B-IV, C-III, D-II

(4) A-II, B-IV, C-III, D-I

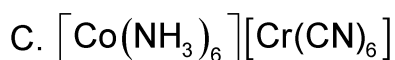
Ans. (1)



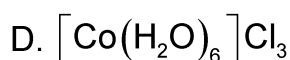
I. Linkage isomerism



II. Ionization isomerism



III. Coordination isomerism



IV. Solvate isomerism

83. Arrange the following elements in increasing order of first ionization enthalpy:

Li, Be, B, C, N

Choose the correct answer from the options given below:

(1) $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{N}$ (2) $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{N}$ (3) $\text{Li} < \text{Be} < \text{C} < \text{B} < \text{N}$ (4) $\text{Li} < \text{Be} < \text{N} < \text{B} < \text{C}$ **MATRIX NEET DIVISION**

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Ans. (2)

Sol. Generally ionisation energy increases in the period from left to right due to increase the effective nuclear charge (Z_{eff}).

but ionisation energy of Be is greater than Boron because 2s-electron in Be is more closer to nucleus (more penetrated) than 2p-electron of boron which far away from nucleus (less penetrated)

So $IE - Li < B < Be < C < N$

84. 1 gram of sodium hydroxide was treated with 25 mL of 0.75M HCl solution, the mass of sodium hydroxide left unreacted is equal to

- (1) 750 mg (2) 250 mg
(3) Zero mg (4) 200 mg

Ans. (2)

Sol. $NaOH + HCl \rightarrow NaCl + H_2O$

mole of NaOH = mole of HCl

$$n = 0.75 \times \frac{25}{1000}$$

$$n = 0.01875$$

$$\text{weight} = 0.01875 \times 40 = 0.75 \text{ gm}$$

$$\text{left mass} = 0.25 \text{ gm} = 250 \text{ mg}$$

85. For the reaction $2A \rightleftharpoons B + C, K_c = 4 \times 10^{-3}$. At a given time, the composition of reaction mixture is : $[A] = [B] = [C] = 2 \times 10^{-3} M$.

Then, which of the following is correct?

- (1) Reaction is at equilibrium.
(2) Reaction has a tendency to go in forward direction.
(3) Reaction has a tendency to go in backward direction.
(4) Reaction has gone to completion in forward direction.

Ans. (3)

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Sol. $Q_c = \frac{[B] \times [C]}{[A]^2} = 1$

since $Q_c > K_c$, so reaction will move in backward direction.

SECTION - B

86. Given below are certain cations. Using inorganic qualitative analysis, arrange them in increasing group number from 0 to VI.

- A. Al^{3+} B. Cu^{2+} C. Ba^{2+} D. Co^{2+}
E. Mg^{2+}

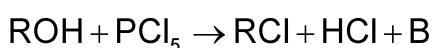
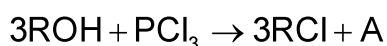
Choose the correct answer from the options given below:

- (1) B, A, D, C, E (2) B, C, A, D, E
(3) E, C, D, B, A (4) E, A, B, C, D

Ans. (1)

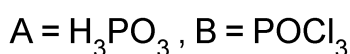
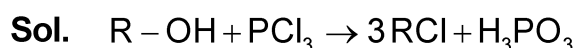
Sol.	Metal ions	Cu^{+2}	Al^{+3}	Co^{+2}	Ba^{+2}	Mg^{+2}
	Group	II	III	IV	V	VI

87. The products A and B obtained in the following reactions, respectively, are



- (1) $POCl_3$ and H_3PO_3
(2) $POCl_3$ and H_3PO_4
(3) H_3PO_4 and $POCl_3$
(4) H_3PO_3 and $POCl_3$

Ans. (4)





88. Mass in grams of copper deposited by passing 9.6487 A current through a voltmeter containing copper sulphate solution for 100 seconds is:

(Given : Molar mass of Cu: 63 g mol^{-1} , $1F = 96487 \text{ C}$)

- (1) 3.15 g (2) 0.315 g
(3) 31.5 g (4) 0.0315 g

Ans. (2)

Sol. $w = Zit$

$$w = \left(\frac{A \cdot w}{x \times F} \right) i \times t$$

$$w = \left(\frac{63}{2 \times 96487} \right) 9.6487 \times 100$$

$$w = 0.315 \text{ g}$$

89. The plot of osmotic pressure (π) vs concentration (mol L^{-1}) for a solution gives a straight line with slope $25.73 \text{ L bar mol}^{-1}$. The temperature at which the osmotic pressure measurement is done is:

(Use $R = 0.083 \text{ L bar mol}^{-1} \text{ K}^{-1}$)

- (1) 37° C (2) 310° C (3) 25.73° C (4) 12.05° C

Ans. (1)

Sol. $\pi = CRT$

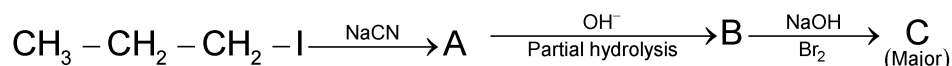
slope of π vs C-graph is RT

$$25.73 = 0.083 \times T$$

$$T = 310 \text{ K}$$

$$T = 37^\circ \text{ C}$$

90. Identify the major product C formed in the following reaction sequence :

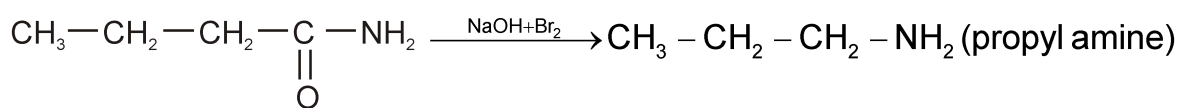
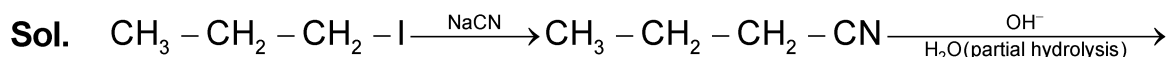


- (1) propylamine (2) butylamine
(3) butanamide (4) -bromobutanoic acid

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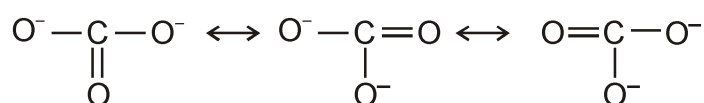
**Ans. (1)**

91. Identify the correct answer.

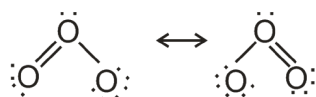
- (1) Three resonance structures can be drawn for ozone.
 (2) BF_3 has non-zero dipole moment.
 (3) Dipole moment of NF_3 is greater than that of NH_3 .
 (4) Three canonical forms can be drawn for CO_3^{2-} ion.

Ans. (4)dipole moment of BF_3 is zero

Carbonate have three canonical structure



ozone have only two resonating structures



92. Given below are two statements :

Statement I : $[\text{Co}(\text{NH}_3)_6]^{3+}$ is a homoleptic complex whereas $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is a heteroleptic complex.

Statement II : Complex $[\text{Co}(\text{NH}_3)_6]^{3+}$ has only one kind of ligands but $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ has more than one kind of ligands.

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

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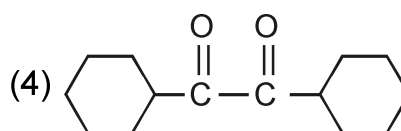
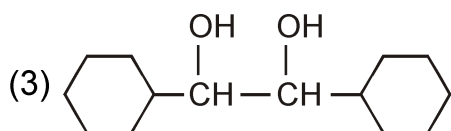
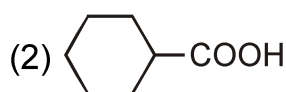
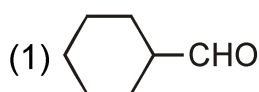
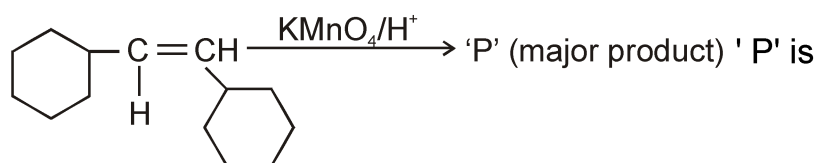
- (1) Both Statement I and Statement II are true.
 (2) Both Statement I and Statement II are false.
 (3) Statement I is true but Statement II is false.
 (4) Statement I is false but Statement II is true.

Ans. (1)

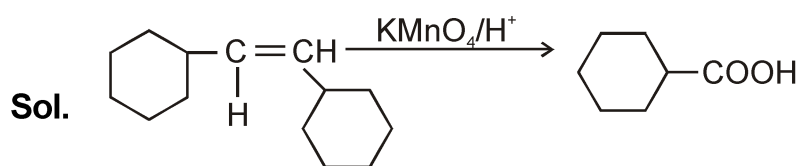
Sol. when a complex have same type of ligands then it called hamoleptic so, is - $[\text{Co}(\text{NH}_3)_6]^{3+}$ is homoleptic complex.

when a complex have different type of ligands then it -Called Heteroleptic so, $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is heteroleptic complex.

93. For the give reaction:



Ans. (2)



94. The pair of lanthanoid ions which are diamagnetic is

- (1) Ce^{4+} and Yb^{2+} (2) Ce^{3+} and Eu^{2+} (3) Gd^{3+} and Eu^{3+} (4) Pm^{3+} and Sm^{3+}

Ans. (1)

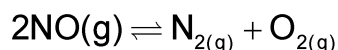


Sol. Ce^{+4} has noble gas configuration (f^0)

$\text{Yb}^{+2} \rightarrow [\text{Xe}] 4f^{14} \rightarrow$ all electrons are paired

95. Consider the following reaction in a sealed vessel at equilibrium with concentrations of

$\text{N}_2 = 3.0 \times 10^{-3} \text{M}$, $\text{O}_2 = 4.2 \times 10^{-3} \text{M}$ and $\text{NO} = 2.8 \times 10^{-3} \text{M}$.

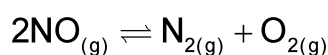


If 0.1 Mol L^{-1} of $\text{NO}_{(\text{g})}$ is taken in a closed vessel, what will be degree of dissociation (α) of $\text{NO}_{(\text{g})}$ at equilibrium?

- (1) 0.00889 (2) 0.0889 (3) 0.8889 (4) 0.717

Ans. (4)

Sol.
$$K_c = \frac{[\text{N}_2] \times [\text{O}_2]}{[\text{NO}]^2} = \frac{3 \times 10^{-3} \times 4.2 \times 10^{-3}}{(2.8 \times 10^{-3})^2} = 1.6$$



0.1

0.1 - 2x x x

$$1.6 = \frac{x^2}{(0.1 - 2x)^2}$$

$$1.26 = \frac{x}{(0.1 - 2x)}$$

$$x = 0.035$$

$$\alpha = \frac{2x}{0.1} = \frac{2 \times 0.035}{0.1} = 0.7$$

96. A compound X contains 32% of A, 20% of B and remaining percentage of C. Then, the empirical formula of X is :

(Given atomic masses of A = 64; B = 40; C = 32u)

- (1) A_2BC_2 (2) ABC_3
 (3) AB_2C_2 (4) ABC_4

Ans. (2)

Sol.	A	B	C
	$\frac{32}{64}$	$\frac{20}{40}$	$\frac{48}{32}$
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{2}$
	1	1	3

ABC₃

97. The work done during reversible isothermal expansion of one mole of hydrogen gas at 25° C from pressure of 20 atmosphere to 10 atmosphere is:

(Given R = 2.0 cal K⁻¹ mol⁻¹)

- (1) 0 calorie (2) -413.14 calories
(3) 413.14 calories (4) 100 calories

Ans. (2)

Sol. $w = -nRT \ln \frac{P_1}{P_2}$

$$= -1 \times 2 \times 298 \ln \frac{20}{10}$$

w = -413.11 Calories

98. During the preparation of Mohr's salt solution (Ferrous ammonium sulphate), which of the following acid is added to prevent hydrolysis of Fe²⁺ ion?

- (1) dilute hydrochloric acid
(2) concentrated sulphuric acid
(3) dilute nitric acid
(4) dilute sulphuric acid

Ans. (4)**MATRIX NEET DIVISION****Office : Piprali Road, Sikar (Raj.) | Ph. 01572-243911****Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in**



Sol. because dil. HNO_3 and conc. H_2SO_4 are oxidising agent so they can convert Fe^{+2} to Fe^{+3} so we use dil. H_2SO_4 to prevent hydrolysis of Fe^{+2} ion.

99. The rate of a reaction quadruples when temperature changes from 27°C to 57°C . Calculate the energy of activation.

Given $R = 8.314\text{ J K}^{-1}\text{ mol}^{-1}$, $\log 4 = 0.6021$

- (1) 38.04 kJ/mol (2) 380.4 kJ/mol (3) 3.80 kJ/mol (4) 3804 kJ/mol

Ans. (1)

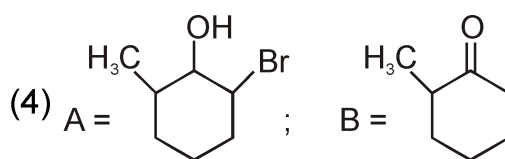
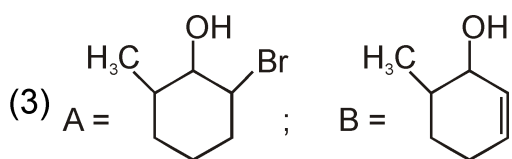
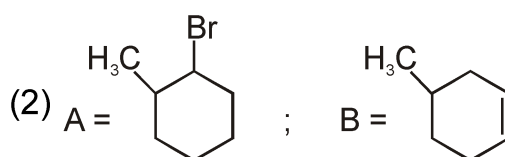
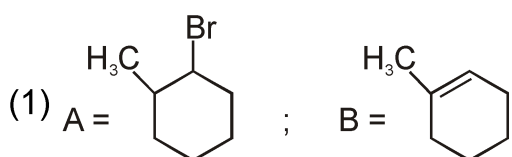
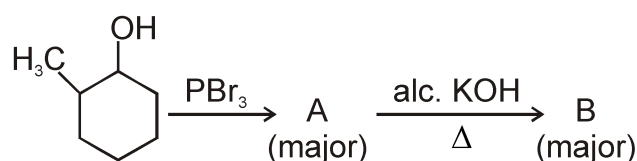
Sol.
$$\log\left(\frac{K_2}{K_1}\right) = \frac{E_a}{2.303R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\log(4) = \frac{E_a}{2.303 \times 8.314}\left(\frac{1}{300} - \frac{1}{330}\right)$$

$$E_a = 38041.50\text{ J/mol}$$

$$E_a = 38.041\text{ kJ/mol}$$

100. Major products A and B formed in the following reaction sequence, are



Ans. (1)

