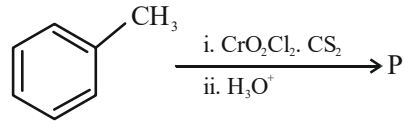
CHEMISTRY

46. Consider the following reaction, and chose the correct option.



(1) Compound **P** is obtained by the hydrogenation of benzoyl chloride with Pd on $BaSO_4$.

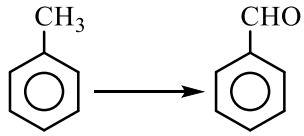
(2) On treating compound **P** with saturated $NaHCO_3$ solution, brisk effervescence is observed.

(3) Compound **P** can be prepared by treating benzene with anhydrous b $AlCl_3$ and CH_3COCl

(4) On treatment with bromine water, compound **P** gives a white precipitate.

Ans. **(1)**

Sol.



47. The formula of tetraammineaquachloridocobalt (III) choloride is

(1) $\left[Co(NH_3)_4(H_2O)Cl\right]Cl_2$ (2) $\left[Co(NH_3)_4Cl_2\right]\times H_2O$

(3) $\left[Co(NH_3)_4\right]Cl_3\times H_2O$ (4) $\left[Co(NH_3)_4(H_2O)Cl\right]Cl$

Ans. **(1)**

Sol. $\left[Co(NH_3)_4(H_2O)Cl\right]Cl_2$

48. The lanthanide ion having four unpaired electrons is

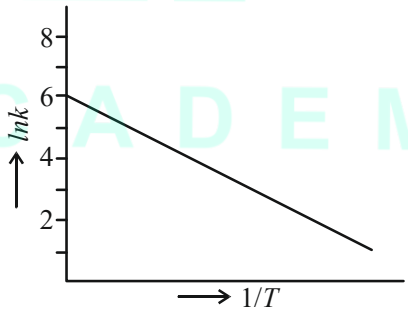
[Given: Atomic numbers of Ce = 58, Nd = 60, Tb = 65 and Ho = 67]

(1) Ho^{3+} (2) Nd^{3+} (3) Ce^{3+} (4) Tb^{3+}

Ans. **(1)**

Sol. Ho^{+3}

49. For an elementary chemical reaction, the Arrhenius plot is given below.



If the energy of activation is 6.64 kJ mol^{-1} and $R = 8.3\,J\,K^{-1}\,mol^{-T}$, the temperature at which the rate constant becomes $e^2\ min^{-1}$, is

(1) 250 K (2) 125 K (3) 150 K (4) 200 K

Ans. **(4)**

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

$\ln k = 6 - \frac{E_a}{RT}$

$$\ln e^2 = 6 - \frac{6.64\times10^3}{8.3\times T}$$

$$2\ln e = 4$$

$$= \frac{6.64\times10^3}{8.3\times T}$$

$$T = \frac{6.64\times10^3}{8.3\times 4}$$

$$\boxed{T = 200K}$$

50. The green paramagnetic species formed by heating $KMnO_4$ at 513 K is

(1) KO_2 (2) K_2MnO_4 (3) Mn_3O_4 (4) MnO

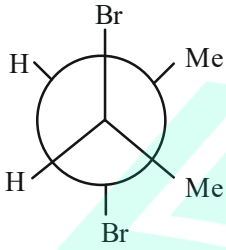
Ans. **(2)**

Sol. $K\overset{+7}{M}nO_4 \longrightarrow K_2\overset{+6}{M}nO_4$

51. Given below ae two statements:

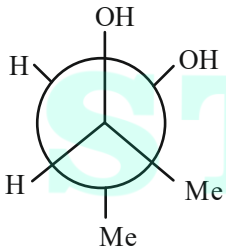
Statement I:

trans-But-2-ene upon treatment with Br_2 in CCl_4 gives the following product



Statement II:

cis-But-2-ene upon treatment with alkaline $KMnO_4$ gives the following product



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

(1) **Statement I** is incorrect but **Statement II** is correct

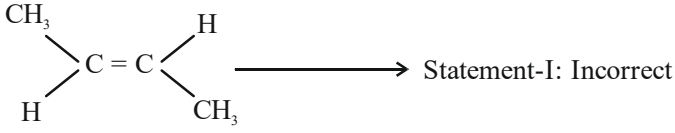
(2) Both **Statement I** and **Statement II** are correct

(3) Both **Statement I** and **Statement II** are incorrect

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

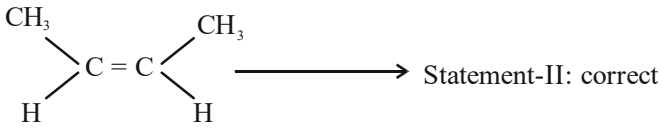
Ans. **(1)**

Sol.



Statement-I: Incorrect

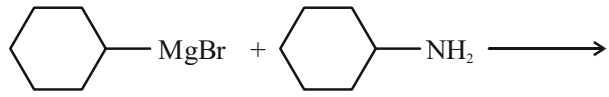
Trans



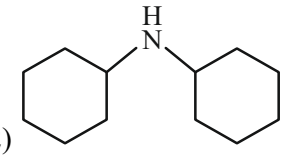
Statement-II: correct

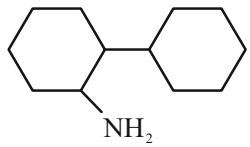
cis

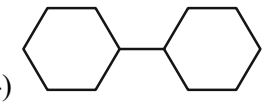
52. One of the products formed in the following reaction is



(1) 

(2) 

(3) 

(4) 

Ans. **(1)**

Sol. 

53. Given below are two statements:

Statement-I: Heating NaCl with concentrated H_2SO_4 and MnO_2 results in oxidation of Mn.

Statement-II: Heating NaI with concentrated H_2SO_4 and MnO_2 results in reduction of Mn.

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

(1) Statement-I is incorrect but Statement-II is correct.

(2) Both Statement-I and Statement-II are correct.

(3) Both Statement-I and Statement-II are incorrect.

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

Ans. **(1)**

Sol. $2NaCl + \overset{+7}{Mn}O_2 + 2H_2SO_4 \longrightarrow Cl_2 + MnSO_4 + \overset{+6}{Na}_2SO_4 + 2H_2O$

$2NaI + \overset{+7}{Mn}O_2 + 2H_2SO_4 \longrightarrow I_2 + MnSO_4 + \overset{+6}{Na}_2SO_4 + 2H_2O$

54. Among the following options, the correct trend in the electron gain enthalpy is

(1) $I > Br > Cl > F$ (2) $F > Cl > Br > I$

(3) $Br > Cl > F > I$ (4) $Cl > F > Br > I$

Ans. **(4)**

Sol. $Cl > F > Br > I$

55. Given below are two statements:

Statement-I: $\left[Fe(ox)_3\right]^{3-}$ is chiral.

Statement-II: trans-$\left[Cr(H_2O)_2(ox)_2\right]^-$ in chiral.

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

(1) **Statement-I** is incorrect but **Statement-II** is correct.

(2) Both **Statement-I** and **Statement-II** are correct.

(3) Both **Statement-I** and **Statement II** are incorrect.

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

Ans. **(4)**

56. The correct statement about peptides and proteins is

(1) In α-helices, the polypeptide chain is twisted into a left-handed screw (helix) through intramolecular hydrogen bonds.

(2) Tertiary structure of proteins has two or more polypeptide subunits.

(3) Only the proteins having a quaternary structure are biologically active.

(4) In β-pleated sheet structures, peptide chains are held together by intermolecular hydrogen bonds.

Ans. **(4)**

Sol. Fact

57. Given below are two statements:

Statement-I: Oxidation of *p* nitrotoluene with acidic $KMnO_4$ gives an acid that is stronger than benzoic acid.

Statement-II: Reduction of *p* nitrotoluene with Sn/HCl followed by neutralization gives an amine that is more basic than aniline.

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

(1) Statement-I is incorrect but Statement-II is correct.

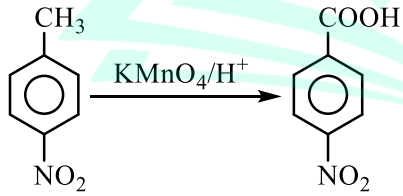
(2) Both Statement-I and Statement-II are correct.

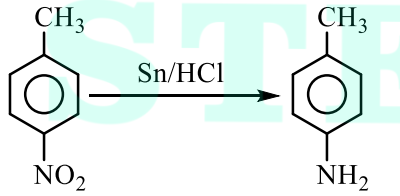
(3) Both Statement-I and Statement-II are incorrect.

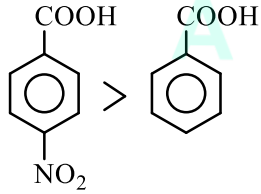
(4) Statement-I is correct but Statement-II is incorrect.

Ans. **(2)**

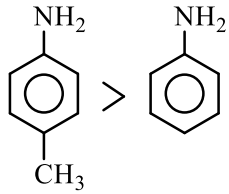
Sol.





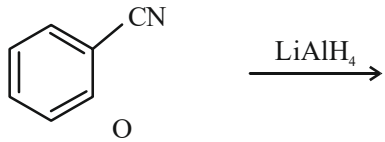


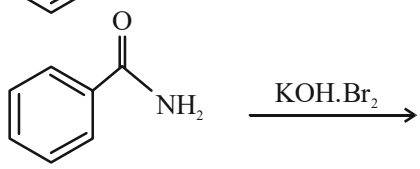
Acidic strength : $-NO_2$ has –I and –M

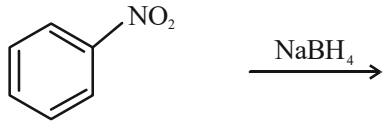


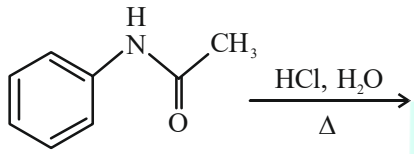
Basic strength : $-CH_3$ has +I and +M

58. Identify the reactions which give aniline as the major product.

A. 

B. 

C. 

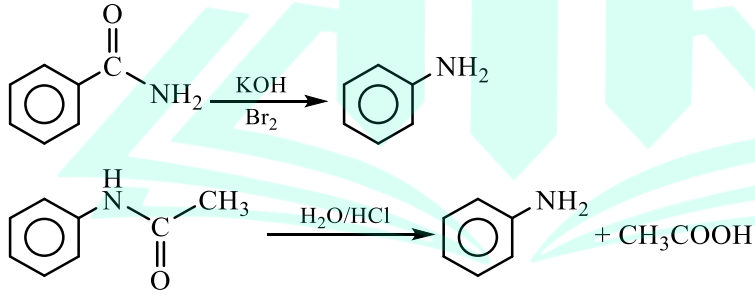
D. 

Choose the correct answer from the options given below.

(1) C and D only (2) A and B only

(3) B and D only (4) A and C only

Ans. **(3)**

Sol. 

59. Two moles of an ideal gas undergo free expansion from 10 L to 100 L at 300 K. The values of ΔS_{system} and $\Delta S_{surroundings}$ are

(R is universal gas constant)

(1) $\Delta S_{system} = 4.606\ R; \Delta S_{surroundings} = 0$

(2) $\Delta S_{system} = 0; \Delta S_{surroundings} = 0$

(3) $\Delta S_{system} = 4.606R; \Delta S_{surroundings} = -4.606R$

(4) $\Delta S_{system} = 0;\ \ \Delta S_{surroundings} = 4.606R$

Ans. **(1)**

Sol. $\Delta S_{system} = 2.303nR \log \frac{V_2}{V_1}$

$= 2.303 \times 2 \times R \log \frac{100}{10}$

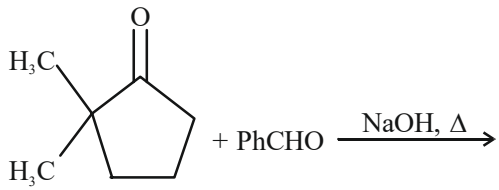
$= 4.606\ R$

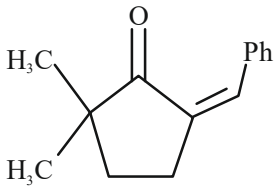
$\Delta S_{surrounding} = -\frac{q}{T}$

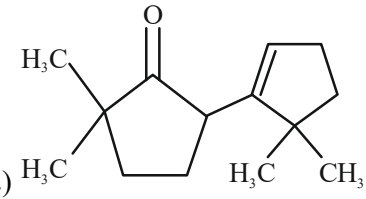
Here $q = 0$

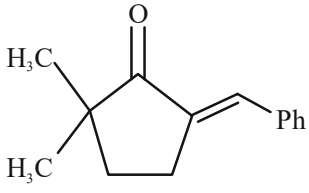
$\Delta S_{surronding}$ = Zero

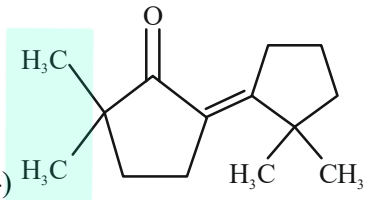
60. The compound that **CANNOT** be obtained from aldol condensation reaction shown below, is



(1) 

(2) 

(3) 

(4) 

Ans. **(2)**

Sol. Since position of double bond increasing is inside ring.

61. The complex which has facial and meridional isomers is

(Given: py = pyridine and en $= H_2N-CH_2-CH_2-NH_2$)

(1) $\left[Ni(en)_2(H_2O)_2\right]^{2+}$ (2) $\left[Cr(py)_3(Cl)_3\right]$

(3) $\left[Cr(H_2O)_6\right]^{3+}$ (4) $\left[Co(NH_3)_4(H_2O)_2\right]^{3+}$

Ans. **(2)**

Sol. Ma_3B_3 shows facial and meridional isomerism.

62. The numbers 17.0145 and 21.0235 were rounded to three figures after the decimal point. The resulting numbers, respectively, are

(1) 17.015 and 21.024 (2) 17.014 and 21.023

(3) 17.015 and 21.023 (4) 17.014 and 21.024

Ans. **(4)**

Sol. $17.0145 = 17.014$

$21.0235 = 21.024$

During rounding off when 5 digit is dropped and preceding digit is even then no change and one unit is added in preceding odd digit.

63. The amount of carbon dioxide evolved upon complete combustion of 116 g of *n*-butane is

(Given: atomic mass in amu $H = 1$, $C = 12$ and $O = 16$)

(1) 362 g (2) 352 g (3) 322 g (4) 176 g

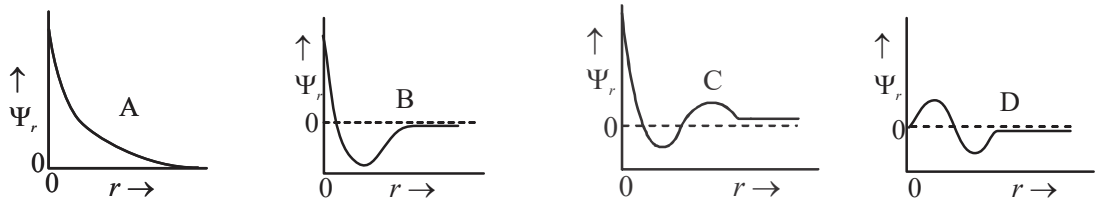
Ans. **(2)**

Sol. $C_4H_{10} + \frac{13}{2}O_2 \rightarrow 4CO_2 + 5H_2O$

$58\text{g} \qquad 4 \times 44\text{g}$

$116\text{ g} \qquad \frac{4 \times 44 \times 116}{58} = 352\text{g}$

64. Consider the following schematic plots of orbital wavefunction (ψ_r) against distance (r) from nucleus.



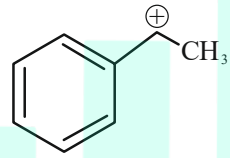
The figure representing two radial nodes in the orbital is

(1) D (2) A (3) B (4) C

Ans. **(4)**

Sol. $\because$ Radial node = 2 in graph C.

65. The following carbocation is stabilized by the interaction of the empty *p* orbital with

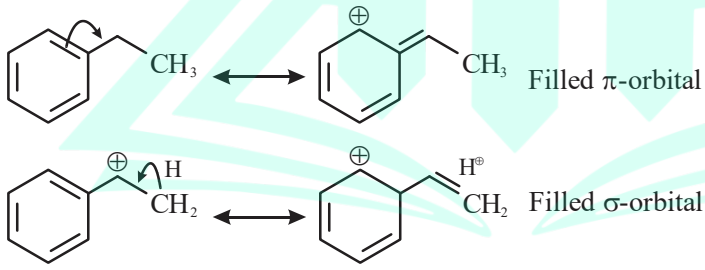


(1) empty σ^* and empty π^* orbitals (2) filled σ and filled π orbitals

(3) empty σ and empty π^* orbitals (4) empty σ^* and filled π orbitals

Ans. **(2)**

Sol.



66. A 1 : 3 electrolyte in an aqueous solution is

(1) $\left[Co(NH_3)_3(NO_2)_3\right]$ (2) $\left[CoCl_2(NH_3)_4\right]Cl$

(3) $\left[CoCl(NH_3)_5\right]Cl_2$ (4) $\left[Co(NH_3)_6\right]Cl_3$

Ans. **(4)**

Sol. $\left[Co(NH_3)_6\right]Cl_3$

67. The standard electrode potential (E°) for the half-cell reaction $Fe^{3+} + e^- \rightarrow Fe^{2+}$ at 298 K is

(Given: $E^\circ\left(Fe^{3+}/Fe\right) = -0.04\,V$ and $E^\circ\left(Fe^{2+}/Fe\right) = -0.44\,V$ at 298 K)

(1) +0.92 V (2) +0.40 V (3) +0.76 V (4) -0.48 V

Ans. **(3)**

Sol. (i) $Fe^{3+} + 3e^- \rightarrow Fe \quad \Delta G_1^0 = -3F \times -0.04 = 0.12F$

(ii) $Fe^{2+} + 2e^- \rightarrow Fe \quad \Delta G_2^0 = -2F \times -0.04 = 0.88F$

(i)—(ii)

$Fe^{3+} + 2e^- \rightarrow Fe^{2+} \quad \Delta G_3^0 = \Delta G_1^0 - \Delta G_2^0 = 0.12F - 0.88F$

$= -0.76F$

Now, $E^\circ \Rightarrow -1 \times F \times E_{cell}^\circ = -0.76F$

$E_0 = 0.76\,V$

68. In potash alum, the ratio of K^+ and SO_4^{2-} ions is

(1) 3 : 2 (2) 1 : 2 (3) 2 : 1 (4) 2 : 3

Ans. **(2)**

Sol. $2K^+ : 4SO_4^{2-}$

1 : 2

69. Consider the following statements about the solutions formed by mixing two liquids.

A. An ideal solution thus formed obeys Raoult's law throughout the composition range.

B. Mixture of chloroform and acetone shows negative deviation from Raoult's law.

C. Mixture of aniline and phenol shows positive deviation from Raoult's law.

(1) A and C only (2) A and B only (3) B and C only (4) A only

Ans. **(2)**

Sol. A and B Correct C is incorrect. (Factual)

70. For a salt XY, which is a strong electrolyte, the plot of Λ_m versus $\sqrt{c}$ has a slope of $-90.0\ S\ cm^2\ mol^{-3/2}\ L^{1/2}$ at 298 K. At 0.01 M concentration of **XY**, the value of Λ_m is $145.0\ S\ cm^2\ mol^{-1}$. The limiting molar conductivity of Y^- ion ($\lambda^0_{Y^-}$, in $S\ cm^2\ mol^{-1}$) at 298 K will be

(Given: $\lambda^0_{X^+} = 74.0\ S\ cm^2\ mol^{-1}$)

(1) 76.0 (2) 80.0 (3) 100.0 (4) 90.0

Ans. **(2)**

Sol. Deby-Huckle concentration equation—

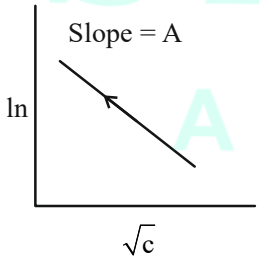
$$\Lambda_m = \Lambda_m^6 - A\sqrt{C}$$

$$14S = A_m^0 - 90 \times \sqrt{0.01}$$

$$\Lambda_m^0 = 14S + 9.0 = 154\ S\ cm^2$$

Now, $\Lambda^0_{xy} = \Lambda^0_x + \Lambda^0_y$

$$154 = 74 + \Lambda^0_y \Rightarrow \Lambda^0_y = 154 - 74 = 80\ S\ cm^2 / mol$$



71. Arrange the following compounds in the increasing order of polarity

A. $CH_3CH_2OCH_2CH_3$ B. CH_3CH_2OH

C. CH_3COCH_3 D. CH_3COOH

Choose the correct answer from the options given below.

(1) $A < C < B < D$ (2) $A < B < C < D$

(3) $C < A < D < B$ (4) $C < A < B < D$

Ans. **(1)**

Sol. A < C < B < D (Factual)

72. According to crystal field theory, the correct order of ligands with respect to their decreasing order of field strength is

(1) $Cl^- > NH_3 > H_2O > CO$ (2) $CO > NH_3 > H_2O > Cl^-$

(3) $CO > H_2O > NH_3 > Cl^-$ (4) $Cl^- > H_2O > NH_3 > CO$

Ans. **(2)**

Sol. $CO > NH_3 > H_2O > Cl^-$ (Factual)

73. The amino acid that gives a red-blood colour on treating its sodium fusion extract with sodium nitroprusside is

(1) serine (2) leucine (3) threonine (4) methionine

Ans. **(4)**

Sol. Sulphur containing amino acid gives blood colour in nitroprusside tests.

74. In an acidic medium, 10 mL of 0.25 M oxalic acid is titrated with $KMnO_4$ solution. If the volume of $KMnO_4$ solution required to reach end point is 10 mL, the strength of the $KMnO_4$ solution is

(1) 0.15 M (2) 0.10 M (3) 0.20 M (4) 0.25 M

Ans. **(2)**

Sol. $N_1V_1 = N_2V_2$

Normality oxalic acid = $0.25 \times 2 = 0.5$

Normality $KMnO_4 = ?$

$0.5 \times 10 = 10 \times N_2$

$N_2 = 5/10 = 0.5\,N$

$$\text{Molarity} = \frac{N}{\text{n factor}} = \frac{0.5}{5} = 0.1\,M$$

75. The correct statement is

(1) Aluminium has five valence orbitals.

(2) Boron has a maximum covalency of four.

(3) Beryllium has three valence orbitals.

(4) Magnesium has a maximum covalency of four.

Ans. **(2)**

Sol. Boron has a max. covalency of four. (Factual)

76. Among the following, the compound having conjugated double bonds is

(1) hepta-1,6-diene (2) hepta-1,3-diene (3) hepta-1,4-diene (4) hepta-1,5-diene

Ans. **(2)**

Sol. 

77. $2A \xrightarrow{k} B$ is a zero-order reaction, where $k = 1.0\,mol\,L^{-1}\,min^{-1}$. If the initial concentration of A is 2 M, then the time taken to complete 75% of the reaction will be

(1) 2.0 min (2) 1.5 min (3) 0.75 min (4) 1.0 min

Ans. **(3)**

Sol. $2A \rightarrow B \Rightarrow \frac{1}{2}\left(\frac{dA}{dt}\right) = K$

$$\frac{-d[A]}{dt} = 2K$$

$$(A)_{0.5} = [A]_{2} - 2Kt_{2\times1\ t}$$

$$2t = 2 - 0.5 = 1.5$$

$$t = 0.75\,min$$

78. The correct order of solubility of the given salts in water at 298 K is

Salt	K_{sp} at 298 K
AgBr	5.0×10^{-13}
$Zn(OH)_2$	1.0×10^{-15}
Hg_2Cl_2	1.3×10^{-18}

(1) $Zn(OH)_2 > AgBr > Hg_2Cl_2$ (2) $Hg_2Cl_2 > Zn(OH)_2 > AgBr$

(3) $AgBr > Zn(OH)_2 > Hg_2Cl_2$ (4) $Hg_2Cl_2 > AgBr > Zn(OH)_2$

Ans. **(1)**

Sol. $AgBr - K_{sP} = S^2 \Rightarrow S = \sqrt{K_{sp}} = \sqrt{5\times0.10^{-13}}$

$$= 7.07\times10^{-7}$$

$$Zn(OH)_2,\ K_{sp} = 4s^3 \Rightarrow S = 3\sqrt{K_{sp}/4} = \sqrt{\frac{1.0\times10^{-15}}{4}} = 6.3\times10^{-6}$$

$$Hg_2Cl_2 \rightarrow \underset{S}{Hg_2^{+2}} + \underset{2S}{2Cl^-}$$

$$4S^3 = K_{sp}$$

$$S = 3\sqrt{K_{sp}/4} = 3\sqrt{\frac{1.3\times10^{-18}}{4}} = 6.87\times10^{-7}$$

$$Zn(OH)_2 > AgBr > Hg_2Cl_2$$

79. The correct decreasing order of oxidation state of the underlined atom in each molecule is

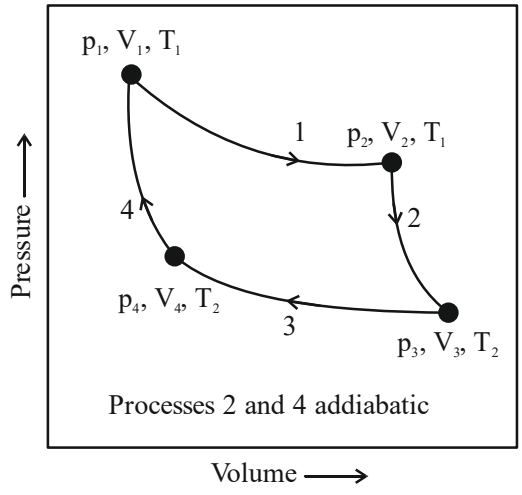
(1) $\underline{P}_4O_6 > \underline{Cl}_2O_7 > \underline{Al}H_3$ (2) $\underline{P}_4O_{10} > \underline{S}O_3 > H_2\underline{O}$

(3) $\underline{N}_2O_5 > \underline{Al}_2O_3 > H_2\underline{S}$ (4) $\underline{Pb}O_2 > \underline{N}_2O_3 > \underline{S}O_3$

Ans. **(3)**

Sol. $\underset{+5}{N_2O_3} > \underset{+3}{Al_2O_3} > \underset{-2}{H_2S}$

80. Consider the reversible processes for 1.0 mol of an ideal gas as shown in the figure.



w_1, w_2, w_3 and w_4 represent work done (in calories) in the processes 1, 2, 3 and 4, respectively; ΔU_2 and ΔU_4 are changes in the internal energy the processes 2 and 4, respective [use $R = 2 cal\, K^{-1}\, mol^{-1}$] The correct option is

(1) $w_1 + w_2 + w_3 + w_4 = 0$

(2) $w_1 + w_3 = -2T_1 \ln \frac{V_2}{V_1} - 2T_2 \ln \frac{V_4}{V_3}$

(3) $w_2 + w_4 = \Delta U_2 - \Delta U_4$

(4) $w_1 + w_2 = 2T_1 \ln \frac{V_2}{V_1}$

Ans. **(2)**

Sol. $W_1 = -nRT \ln V_2 / V_1 = -2T_1 \ln (V_2 / V_1)$

$W_3 = -nRT \ln (v_4 / v_5) = -2T_2 \ln (v_4 / v_3)$

$sum = w_1 + w_3 = -2T_1 \ln (v_2 / v_1) - 2T_2 \ln (v_4 / v_3)$

81. **Assertion A:**

For an ideal solution formed by mixing liquids **P** and **Q**, $\Delta_{mix} H = 0$ and $\Delta_{mix} V = 0$

Reason R:

No interactions occur between **P** and **Q** In the light of the above statements, choose the most appropriate answer from the options given below.

(1) **A** is not correct but **R** is correct

(2) Both **A** and **R** are correct and **R** is the correct explanation of **A**

(3) Both **A** and **R** are correct but *R* is NOT the correct explanation of **A**

(4) **A** is correct but **R** is not correct

Ans. **(4)**

Sol. There is similar interaction between liquid P and liquid Q as that of interaction in liquid P and liquid Q.

82. Among the species given below, the spin-only magnetic moment is highest for

(Given: Atomic number of Ti = 22, Mn = 25, Fe = 26 and Co = 27)

(1) $\left[Ti(H_2O)_6\right]^{3+}$ (2) $\left[Mn(CN)_6\right]^{3-}$ (3) $\left[Fe(CN)_6\right]^{3-}$ (4) $\left[Co(NH_3)_6\right]^{3+}$

Ans. **(2)**

Sol. $T_i^{3+} : 3d^1$ (1 unpaired e^-)

$Mn^{3+} : 3d^4 = \left(t_{2g}^4 eg^0\right)$ (2 unpaired e^-)

$Fe^{3+} : 3d^5 \left(t_{2g}^5 eg^0\right)$ (1 unpaired e^-)

$C_0^{3+} : 3d^6 \left(t_{2g}^6\ eg^0\right)$ (0 unpaired e^-)

83. A protein undergoes reversible thermal denaturation from its initial state **N** to denatured state **D** according to $\mathbf{N} \rightleftharpoons \mathbf{D}$. At 60°, the concentrations of both **N** and **D** are equal at equilibrium, and the standard enthalpy change of denaturation is $666\, kJ\ mol^{-1}$. The standard entropy change (ΔS° in $kJ\ K^{-1}\ mol^{-1}$) of the protein upon denaturation at 60° closest to

(1) 11.1 (2) 2.0 (3) 2000.0 (4) 333.0

Ans. **(2)**

Sol. $N \rightleftharpoons D$

$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$

$\Delta G^\circ = 0$

$\Delta H^\circ = T\Delta S^\circ$

$\Delta S^\circ = \frac{\Delta H^\circ}{T} = \frac{666}{333} = 2\,kJ\,K^{-1}\,mol^{-1}$

84. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason **R**.

Assertion A: Generally, 3d transition metals have high melting points.

Reason R: Involvement of 3d-electrons in addition to 4s-electrons in the interatomic metallic bonding.

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

(1) **A** is not correct but **R** is correct.

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

(3) Both **A** and **R** are correct and **R** is NOT the correct explanation of **A**.

(4) **A** is correct but **R** is not correct.

Ans. **(2)**

Sol. In Transition metal energy of 3d orbital is very close to 4S orbital as a result both e^- of 3d and 4S involve in metallic bonding.

85. Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A: The first ionization enthalpy of O is lower than that of N and F.

Reason R: The loss of an electron from O leads to stable half-filled *p* orbital.

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

(1) **A** is not correct but **R** is correct.

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

(3) Both **A** and **R** are correct and **R** is NOT the correct explanation of **A**.

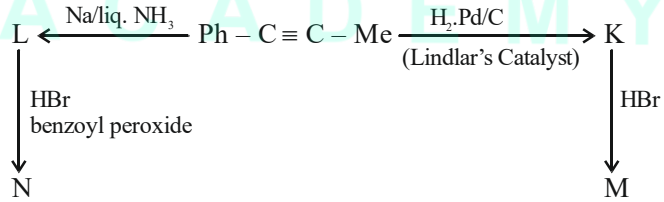
(4) **A** is correct but **R** is not correct.

Ans. **(2)**

Sol. I.E.: O < N < F

After removal of e^- from O, O^+ becomes $2P^3$ (half-filled stable)

86. Consider the following reaction sequences and choose the correct option.



(1) **M** and **N** stereoisomers

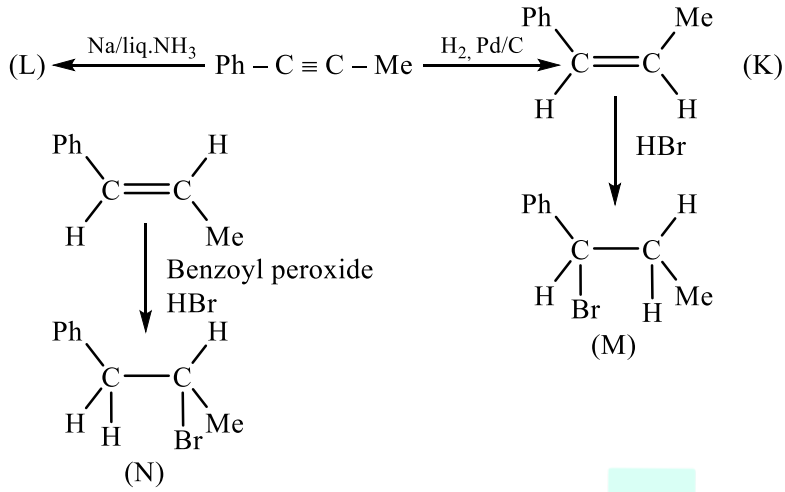
(2) **K** and **L** are geometrical isomers

(3) **K** and **L** are enantiomers

(4) **M** and **N** are geometrical isomers

Ans. **(2)**

Sol.



K and L are G.I

87. The highest occupied molecular orbital for Ne_2 is

(1) σ^{*}_{2p} (2) π_{2p} (3) σ_{2p} (4) π^{*}_{2p}

Ans. **(1)**

Sol. σ*2p : H.O.M.O

88. Match the species in List-I with their geometry in List-II.

List-I	**List-II**
A. PCl_5	I. Tetrahedral
B. BrF_5	II. Square Planar
C. BF_4^-	III. Trigonal bipyramidal
D. $[Ni(CN)_4]^{2}$	IV. Square pyramidal

Choose the correct answer from the options given below:

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

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

Ans. **(3)**

Sol. PCl_5 : sp^3d

BrF_5 : sp^3d^2

BF_4^- : sp^3

$[Ni(CN)_4]^{2}$: dsp^2

89. Match the vitamin in in List-I with their source in List-II.

List-I	**List-II**
A. vitamin A	I. meat
B. vitamin B_{12}	II. Sunflower oil
C. vitamin E	III. Green leafy vegetables
D. vitamin K	IV. carrots

Choose the correct answer from the options given below:

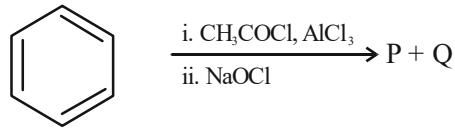
(1) A—III, B—I, C—IV, D—II (2) A—II B—III, C—IV, D—I

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

Ans. **(3)**

Sol. Fact

90. For the following reaction sequence, choose the correct option



(1) Both **P** and **Q** are carbonyl compounds.

(2) If **P** is the sodium salt of a carboxylic acid, **Q** is a primary alcohol.

(3) **P** and **Q** are aromatic compounds.

(4) If **P** gives a carboxylic acid on acidification, **Q** gives a poisonous gas on exposure to air and light.

Ans. **(4)**

Sol.