JEE Main April 2026

Question Paper With Text Solution

06 April | Shift -2

CHEMISTRY

MATRIX

JEE Main & Advanced | XI-XII Foundation| VI-X Pre-Foundation

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JEE MAIN APRIL 2026 | 06 APRIL SHIFT-2

SECTION – A

Question ID : 6911211251

51. Which of the following contain the same number of atoms ?

(Given : Molar mass in g mol^{-1} of H, He, O and S are 1, 4, 16 and 32 respectively).

A. 2g of O_2 gas

B. 4g of SO_2 gas

C. 1400 mL of O_2 at STP

D. 0.05 L of He at STP

E. 0.0625 mol of H_2 gas

Choose the correct answer from the options given below :

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(1) A and B only

(2) B and C only

(3) C and D only

(4) A, C and E only

Ans. (4)

Sol. $n_{O_2} = \frac{2}{32}$

No. of atom (O) $= 2 \times \frac{2}{32} \times N_A = 0.125N_A$

$n_{SO_2} = \frac{4}{64}$

No. of atom $= 3 \times \frac{4}{64} \times N_A = 0.1875N_A$

$n_{O_2} = \frac{1400}{22400}$

No. of atom $= \frac{1400}{22400} \times 2 \times N_A = 0.125N_A$

$n_{He} = \frac{0.05}{22.4}$

No. of atom $= \frac{0.05}{22.4} \times N_A = 0.0022N_A$

$n_{H_2} = 0.0625$

No. of atom = $0.0625 \times 2 \times N_A = 0.125\ N_A$

Question Id : 6911211252

52. The Bohr radius of a hydrogen like species is 70.53 pm. The species and the stationary state (n) are respectively.

(Given : Hydrogen atom Bohr radius is 52.9 pm)

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(1) Li^{2+}, 3 (2) He^{+}, 3 (3) He^{+}, 2 (4) Li^{2+}, 2

Ans. (4)

Sol. $r_n = 52.9\frac{n^2}{z}pm$

$70.53 = 52.9\frac{n^2}{z}$

$1.33 = \frac{n^2}{z}$

Li^{2+} $z = 3$

$n = 2$

Question Id : 6911211253

53. Given below are two statements :

Statement I : The number of compounds among SO_2, SO_3, SF_4, SF_6 and H_2S in which sulphur does not obey the Octet Rule is 3.

Statement II : Among [H_2O, ClF_3, SF_4], [NH_3, BrF_5, SF_4], [BrF_5, ClF_3, XeF_4] and [XeF_4, ClF_3, H_2O], the number of sets in which all the molecules have one lone pair of electrons on the central atom is 1.

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

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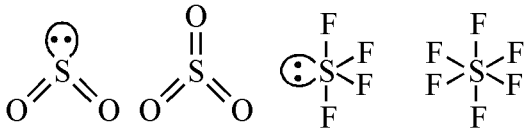
(1) Both Statement I and and Statement II are true.

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

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

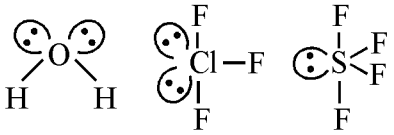
(4) Statement I is false but Statement II is true.

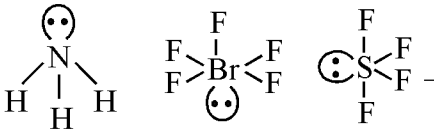
Ans. (4)

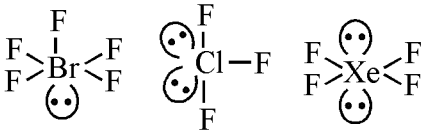
Sol. 

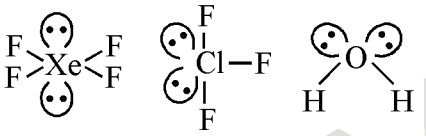
do not follow octet rule.

Statement I is false.



 → this set has one lone pair on central atom.





Statement II is true.

Question Id : 6911211254

54. Match List-I with List-II.

Given V_1 and V_2 are initial and final volumes respectively.

List-I (Isothermal process)	**List-II (Expression)**
A. Reversible expansion	I. $q = 0$
B. Free expansion	II. $q = nRT\ell n\frac{V_2}{V_1}$
C. Irreversible Compression	III. $w = -p_{ext}(V_1 - V_2)$
D. Cyclic reversible	IV. $\frac{q_{rev}}{T} = 0$

Choose the correct answer from the options given below :

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

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

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

Ans. (3)

Sol. Isothermal process

Reversible expansion $\Delta U = 0$

$$w = -q$$

So, $q = -w = -\left(-nRT\ell n\frac{V_2}{V_1}\right)$

$$= nRT\ell n\frac{V_2}{V_1}$$

$A \rightarrow II$

Free expansion

$q = 0$

$B \rightarrow I$

Irreversible compression

$W = -p_{ext}(V_2 - V_1)$

Cyclic reversible

$$\frac{q_{rev}}{T} = 0$$

$D \rightarrow 4$

Question Id : 6911211255

55. Given below are two statements :

Chamber I	Semi-permeable membrane	Chamber 2
18 g glucose in 100 mL aqueous solution		30 g glucose in 250 mL aqueous solution

Statement I : H_2O molecules move from the chamber 1 to chamber 2.

Statement II : The osmotic pressure of a solution prepared by dissolving 50 mg of potassium sulphate (molar mass = 174 g/mol) in 2 L of water (at 27°C) is 0.0107 bar. (Given R = 0.083 dm^3 bar K^{-1} mol^{-1} and assume complete dissociation of electrolyte)

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. (4)

Sol.

Chamber I		Chamber 2
18 g glucose 100 mL		30 g glucose 250 mL

SPM

$$\text{Molarity chamber 1} = \frac{\frac{18}{180}}{\frac{100}{1000}}$$

$$= 1$$

$$\text{Molarity chamber 2} = \frac{\frac{30}{180}}{\frac{250}{1000}}$$

$$= 0.67$$

H_2O molecules will move from chamber 2 to chamber 1.

So, statement 1 is false.

$\pi = iCRT$

$$= 3 \times \frac{\frac{50 \times 10^{-3}}{174}}{2} \times 0.083 \times 300$$

$= 0.0107$ bar

K_2SO_4

$i = 3$

So, statement II is true.

Question Id : 6911211256

56. Given is a concentrated solution of a weak electrolyte A_xB_y of concentration 'c' and dissociation constant 'K'. The degree of dissociation is given by :

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(1) $[K \times c^{x+y-1}x^xy^y]^{x+y}$

(2) $\left(\frac{K}{c^{x+y-1}x^xy^y}\right)^{\frac{1}{x+y}}$

(3) $\left(\frac{c^{x+y-1}x^xy^y}{K}\right)^{x+y}$

(4) $\left(\frac{c^{x+y-1}x^xy^y}{K}\right)^{\frac{1}{x+y}}$

Ans. (2)

Sol. $A_xB_y \rightleftharpoons xA^{y+} + yB^{x-}$

c

$c-\alpha \qquad xc\alpha \qquad yc\alpha$

$$k = \frac{(xc\alpha)^x (yc\alpha)^y}{c - c\alpha}$$

$$k = \frac{x^x y^y c^{x+y-1}\alpha^{x+y}}{1-\alpha}$$

$1-\alpha \simeq 1$

$$\alpha = \left(\frac{k}{x^x y^y c^{x+y-1}}\right)^{\frac{1}{x+y}}$$

Question Id : 6911211257

57. For a general redox reaction

Anode $\qquad Red_1 \rightarrow Ox_1^{n_1^+} + n_1e^-$

Cathode $\qquad Ox_2 + n_2e^- \rightarrow Red_2^{n_2^-}$

Which of the following statement is incorrect ?

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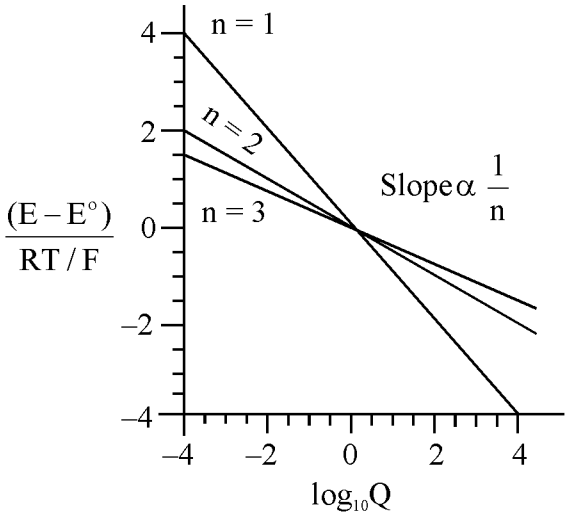
(1) The overall reaction can be written as $n_2\,Red_1 + n_1Ox_2 \rightleftharpoons n_2Ox_1^{n_1^+} + n_1\,Red_2^{n_2^-}$

(2) The electrons do not appear in the overall reaction because electrons produced at the anode are consumed at the cathode.



(3) Here n is the number of electrons transferred in redox reaction.

(4) If the reaction is carried out reversibly, the electrical work done is equal to the ratio of charge and potential difference through which charge is moved.

Ans. (4)

Sol. Anode $\quad Red_1 \rightarrow Ox_1^{n_1^+} + n_1e^- \quad \times n_2$

Cathode $\quad Ox_2 + n_2e^- \rightarrow Red_2^{n_2^-} \quad \times n_1$

$$n_2red_1 + n_1Ox_2 \rightarrow n_2O_{x_1}^{n_1^+} + n_1\,Red_2^{n_2^-}$$

Statement I is correct.

The e^-s do not appear in the overall reaction.

Statement II is correct.

$\Delta G = \Delta G° + RT\,ln Q$

$-nFE = -nFE° + RT2.303 \log Q$

$$E = E° - \frac{RT2.303}{nF}\log Q$$

$$E - E° = -\frac{RT2.303}{nF}\log Q$$

$$\frac{E - E°}{\frac{RT}{F}} = -\frac{2.303}{n}\log Q$$

$$\text{slope} = -\frac{2.303}{n}$$

Statement III is correct.

$\Delta G^\circ = -nFE^\circ$ = electrical w done
nF = charge
E° = potential difference
Statement IV is incorrect.

Question Id : 6911211258

58. In a period, the first ionisation enthalpy of the element at extreme left and the negative electron gain enthalpy of the extreme right element, except noble gases, are respectively

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(1) lowest and lowest
(2) highest and lowest
(3) lowest and highest
(4) highest and highest

Ans. (3)

Sol. In a period
first ionisation enthalpy at extreme left is lowest.
negative electron gain enthalpy at extreme right is highest.

Question Id : 6911211259

59. Given below are two statements :
Statement I : $F_2O < H_2O < Cl_2O$ is the correct trend in terms of bond angle.
Statement II : SiF_4, SnF_4 and PbF_4 are ionic in nature.
In the light of the above statements, choose the correct answer from the options given below :

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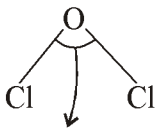
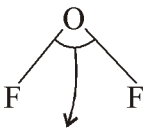
(1) Both Statement I and Statement II are true.
(2) Both Statement I and Statement II are false.
(3) Statement I is true but Statement II is false.
(4) Statement I is false but Statement II is true.

Ans. (3)

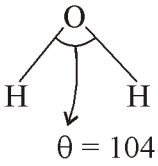
Sol.



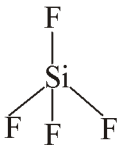
$\theta = 110^\circ$ to 111°



$\theta = 103^\circ$



Statement I is correct.



is covalent

SnF_4 and PbF_4 are ionic in nature.

Statement II is false.

Question Id : 6911211260

60. The correct order of first (Δ_iH_1) and second (Δ_iH_2) ionisation enthalpy values of Cr and Mn are :

A. Δ_iH_1 : Cr > Mn

B. Δ_iH_2 : Cr > Mn

C. Δ_iH_1 : Mn > Cr

D. Δ_iH_2 : Mn > Cr

Choose the correct answer from the options given below :

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

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

Ans. (2)

Sol.

	Δ_iH_1 (kJ/mol)	Δ_iH_2 (kJ/mol)
Cr	653	1592
Mn	717	1509

Question Id : 6911211261

61. Which of the following sequences of hybridisation, geometry and magnetic nature are correct for the given coordination compounds ?

A. $[NiCl_4]^{2-}$ – sp^3, tetrahedral, paramagnetic

B. $[Ni(NH_3)_6]^{2+}$ – sp^3d^2, octahedral, paramagnetic

C. $[Ni(CO)_4]$ – sp^3, tetrahedral, paramagnetic

D. $[Ni(CN)_4]^{2-}$ – dsp^2, square planar, diamagnetic

Choose the correct answer from the options given below :

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

Ans. (4)

Sol. $[NiCl_4]^{2-}$

Ni^{2+} $3d^8$ $4s^0$ sp^3 tetrahedral paramagnetic

$[Ni(NH_3)_6]^{2+}$

Ni^{2+} $3d^8$ $4s^0$ sp^3d^2 octahedral paramagnetic

$[Ni(CO)_4]$

$Ni°$ $3d^8$ $4s^2 \rightarrow 3d^{10}$ $4s^0$

sp^3 tetrahedral diamagnetic

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

Ni^{2+} $3d^8 4s^0$ pairing will happen

dsp^2 square planar diamagnetic

Question Id : 6911211262

62. Given below are two statements :

Statement I : A mixture of $C_{12}H_{22}O_{11}$ (sugar) and NaCl can be separated by dissolving sugar in alcohol, due to differential solubility.

Statement II : Rose essence from rose petals is separated by steam distillation due to its high volatility and insolubility in H_2O.

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. Sugar dissolves in alcohol but NaCl does not.

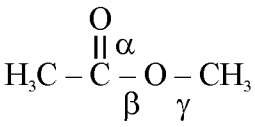
Statement I is correct.

Rose essence can be separated by steam distillation.

Statement II is correct.

Question Id : 6911211263

63. Shown below is the structure of methyl acetate with three different α, β and γ carbon–oxygen bonds.



The correct order of bond lengths of these bonds is :

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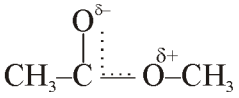
(1) $\alpha > \beta > \gamma$ (2) $\alpha < \beta < \gamma$

(3) $\alpha = \beta = \gamma$ (4) $\alpha < \beta = \gamma$

Ans. (2)

Sol.

Hybrid



$\gamma \rightarrow$ always single bond

α and β are partial double bond

$\alpha < \beta$ beause structure I is more stable and more contribution in hybrid.

Question Id : 6911211264

64. 'x' is the product which is obtained by the hydrolysis of prop-1-yne in the presence of mercuric sulphate under dilute acidic medium at 333 K. 'y' is the product which is obtained by the reaction of ethane nitrile with methyl magnesium bromide in dry ether followed by hydrolysis. IUPAC name of product obtained from 'x' and 'y' in the presence of barium hydroxide followed by heating is :

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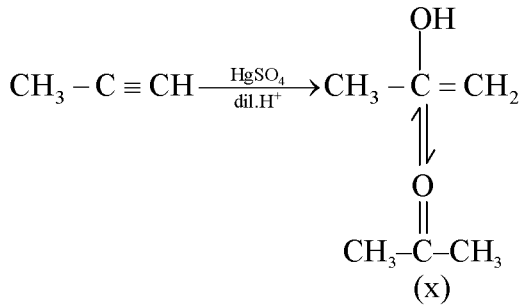
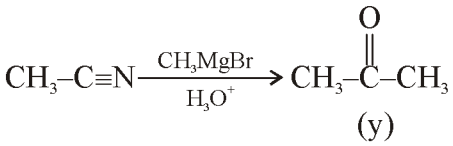
(1) 2-Methylpent-4-en-3one (2) 4-Methylpent-3-en-2-one

(3) 4-Methylpent-1-ene (4) 2-Methylpent-3-one

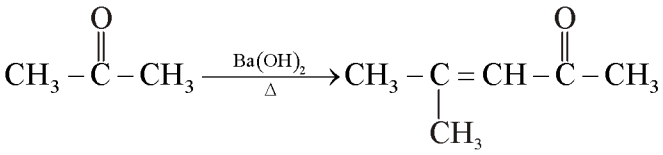
Ans. (2)

Sol.





(y)



4–Methylpent–3–en–2–one

Question Id : 6911211265

65. An optically active alkyl bromide C_4H_9Br, reacts with ethanolic KOH to form major compound [A] which reacts with bromine to give compound [B]. Compound [B] reacts with ethanolic KOH and sodamide to give compound [C]. One molecule of water adds to compound [C] on warming with mercuric sulphate and dilute sulphuric acid at 333 K to form compound [D]. The functional group in compound D will be confirmed by :

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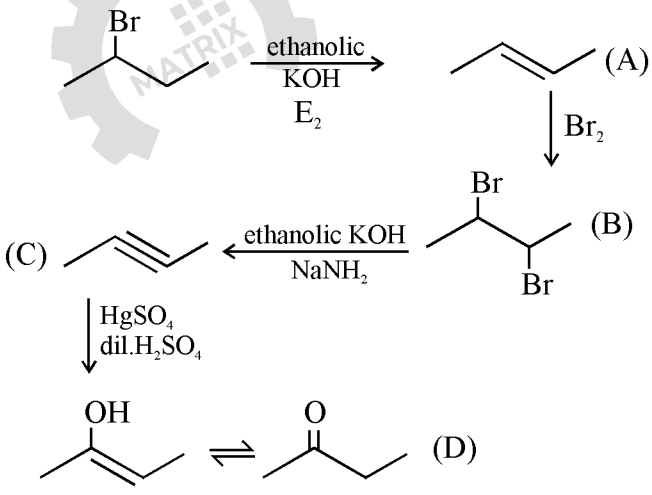
(1) Haloform test (2) Lucas test

(3) Silver mirror test (4) Benedict test

Ans. (1)

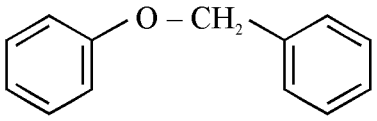
Sol.



can give haloform test

Question ID : 6911211266

66. Consider the following reaction.



+ HI → Product

Statement I: In the above reaction, product formed will be a mixture of benzyl alcohol and iodobenzene.

Statement II : In the above reaction, the –O–CH_2– bond is cleaved to give the product.

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

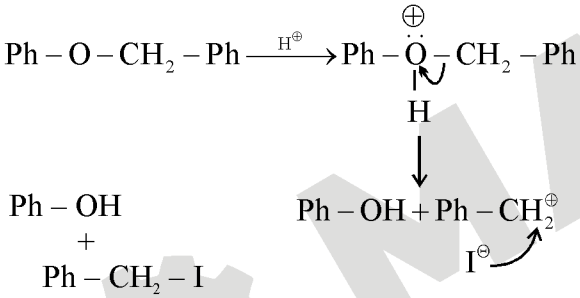
(2) Both Statement I and Statement II are false

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

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

Ans. (4)

Sol.

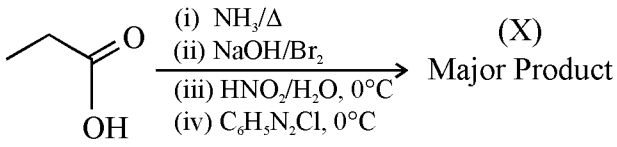


Statement I is false

Statement II is true

Question ID : 6911211267

67. Consider the following organic reaction sequence. Choose the final product (X) from the following (consider the major product in all intermediate reactions)



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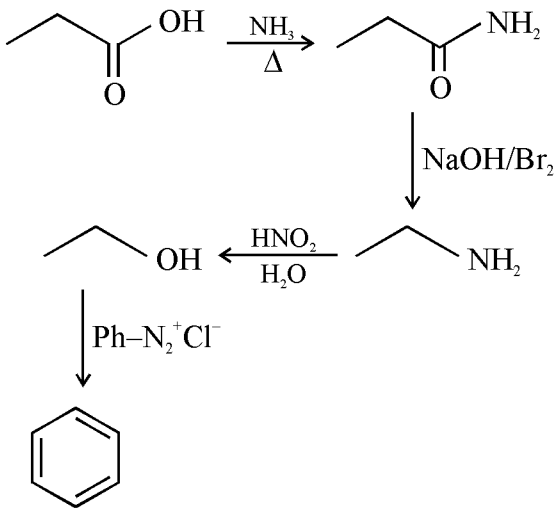
(1) Benzene (2) Phenol (3) Propanol (4) Chlorobenzene

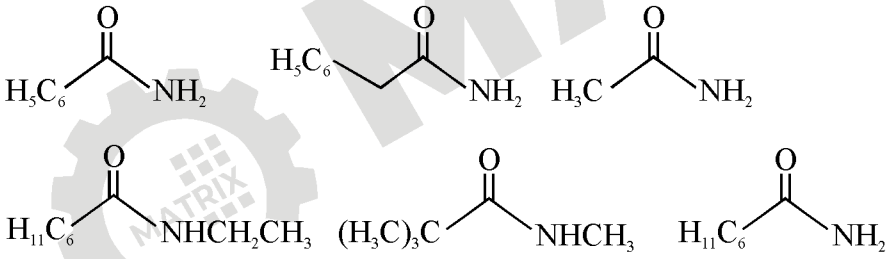
Ans. (1)

Sol.



Question ID : 6911211268

68. The number of compounds from the following which can undergo reaction with Br_2 /KOH (alcoholic) to give respective products and these respective products can also be obtained separately by Gabriel phthalimide reaction is :



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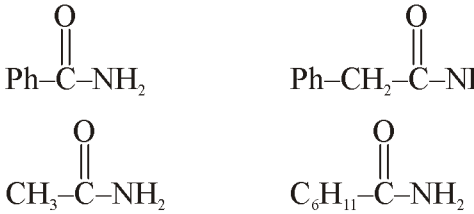
(1) 5 (2) 4 (3) 3 (4) 6

Ans. (2)

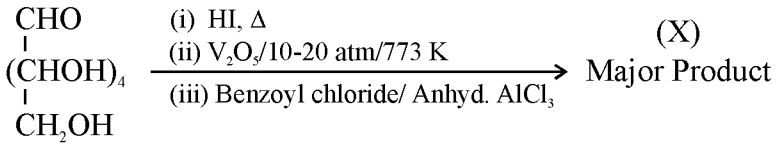
Sol. 1°amide $\xrightarrow[KOH]{Br_2}$ 1°amine

1° amine can also be prepared by Gabriel pthalimide reaction.



Question ID : 6911211269

69. Consider the following reactions. Total number of electrons in the π bonds and lone pair of electrons in the product (X) is:



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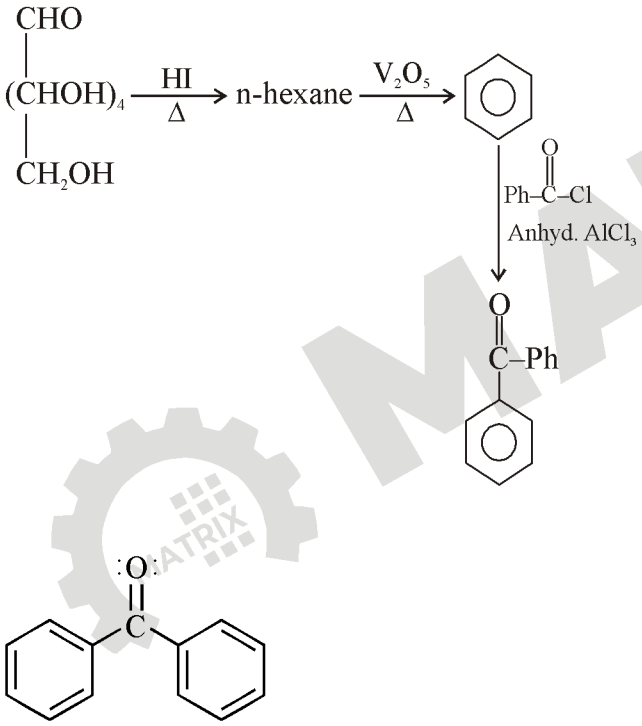
(1) 12 (2) 16 (3) 14 (4) 18

Ans. (4)

Sol.



no. of π bonds = 7

No. of e^- in π bond = 14
No. of lone pair = 2
No. of e^- in lone pair = 4
→ 18

Question ID : 6911211270

70. Treatment of a gas 'X' with a freshly prepared ferrous sulphate solution gives a compound 'Y' as a brown

ring. The compounds X and Y are.

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(1) NO and $[Fe(NO)]SO_4$

(2) NO_2 and $[Fe(NO_2)]SO_4$

(3) N_2O and $[Fe(N_2O)]SO_4$

(4) N_2O_4 and $[Fe(N_2O_4)]SO_4$

Ans. (1)

Sol. $NO + FeSO_4 \longrightarrow [Fe(NO)]SO_4$

gas Brown ring

SECTION – B

Question ID : 6911211271

71. An excess of $AgNO_3$ is added to 100 mL of a 0.05 M solution of tetraaquadichloridochromium (III) chloride. The number of moles of AgCl precipitated will be _____$\times 10^{-3}$. (Nearest integer)

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Ans. (5)

Sol. $[Cr(H_2O)_4Cl_2]Cl + AgNO_3 \longrightarrow AgCl\downarrow$

100 mL excess

0.05 M

M moles 5 5

M moles of AgCl = 5

Moles of AgCl = 5×10^{-3}

Question ID : 6911211272

72. An alkane (Y) requires 8 moles of oxygen for complete combustion and on chlorination with $Cl_2/h\nu$ (Y) gives only one monochlorinated product (Z). The total number of primary carbon atoms in (Y) is _____.

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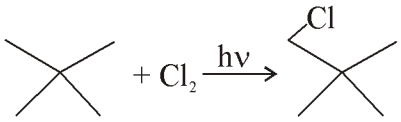
Ans. (4)

Sol. $C_xH_y + \left(x + \frac{y}{4}\right)O_2 \rightarrow xCO_2 + \frac{y}{2}H_2O$

$x + \frac{y}{4} = 8$

So, x = 5 y = 12

C_5H_{12} is the alkane



Only one mono chlorinated product

4 Primary C atoms

Question ID : 6911211273

73. 500 mL of 0.2M MnO_4^- solution in basic medium when mixed with 500 mL of 1.5 M KI solution, oxidises iodide ions to liberate molecular iodine. This liberated iodine is then titrated with a standard *x* M thiosulphate solution in presence of starch till the end point. If 300 mL of thiosulphate was consumed, then the value of x is _____ .

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Ans. (1)

Sol. $MnO_4^- + I^- \longrightarrow I_2 + MnO_2$

$I_2 + S_2O_3^{2-} \longrightarrow S_4O_6^{2-} + I^-$

Meq. of MnO_4^- = 500 × 0.2 × 3 = 300

Meq. of KI = 500 × 1.5 × 1 = 750

Meq. of I_2 liberated = 300

Meq. I_2 = M eq. thiosulphate

300 = x × 300 × 1

x = 1

Question ID : 6911211274

74. In a closed flask at 600 K , one mole of X_2Y_4 (g) attains equilibrium as given below :

$$X_2Y_4(g) \rightleftharpoons 2XY_2(g)$$

At equilibrium, 75% X_2Y_4 g) was dissociated and the total pressure is 1 atm . The magnitude of $\Delta_r G^{\ominus}\left(\text{inkJmol}^{-1}\right)$ at this temperature is _____. (Nearest Integer)

(Given : $R = 8.3\,J\,mol^{-1}\,K^{-1}; \ln 10 = 2.3, \log 2 = 0.3, \log 3 = 0.48, \log 5 = 0.69, \log 7 = 0.84$)

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Ans. (8)

Sol. $X_2Y_4 \rightleftharpoons 2XY_2$

P

P–Pα 2Pα

$P - P\alpha + 2P\alpha = P_T$

$$P_T = \frac{P}{1+\alpha}$$

$$K_P = \frac{(2P\alpha)^2}{P(1-\alpha)}$$

$$= \frac{4P\alpha^2}{1-\alpha} \quad \alpha = 0.75$$

$$= \frac{4P_T\alpha^2}{1-\alpha^2}$$

$= 5.14$

$\Delta G^\circ = -RT\ln K_P$

$= -8153.99$

$\simeq -8154$

$\simeq -8.154$ kJ/mole

Question ID : 6911211275

75. Decomposition of a hydrocarbon follows the equation $k = \left(5.5\times10^{11}\ s^{-1}\right)e^{\frac{-28000\ K}{T}}$. The activation energy of reaction is _____kJ mol^{-1}. (Nearest Integer)

Given : R =8.3 J K^{-1} mol^{-1}

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Ans. (232)

Sol. $K = Ae^{-\frac{E_a}{RT}}$

$= 5.5\times10^{11}e^{-\frac{28000}{T}}$

$\frac{E_a}{R} = 28000$

$E_a = 232400$

$= 232.4$ kJ mol^{-1}