

SECTION -3

PART-A

[SINGLE CORRECT CHOICE TYPE]

Q.1 to Q.6 has four choices (A), (B), (C), (D) out of which ONLY ONE is correct.

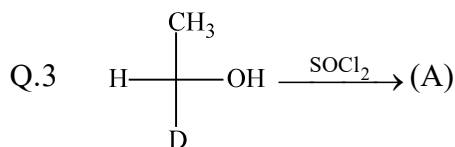
Q.1 8.7 gm of pyrolusite (impure MnO_2) were heated with concentrated HCl. The Cl_2 gas evolved was passed through excess of KI solution. The iodine gas evolved required 80 ml of $\frac{N}{10}$ hypo solution.

The % of MnO_2 in pyrolusite will be

- (A) 4 % (B) 40 % (C) 8 % (D) 80 %

Q.2 Which of the following is a bidentate ligand?

- (A) $\ddot{\text{N}}\text{H}_2 - \text{CH}_2 - \text{CH}_2 - \ddot{\text{N}}\text{H}_2$ (B) $:\ddot{\text{N}}^- = \overset{+}{\text{N}} = \ddot{\text{N}}:$
 (C) $:\ddot{\text{O}}^- - \text{C} \equiv \text{N}:$ (D) All of these



Major product (A) is:

- (A) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H} - \text{C} - \text{Cl} \\ | \\ \text{D} \end{array}$ (B) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{Cl} - \text{C} - \text{H} \\ | \\ \text{D} \end{array}$ (C) $\text{H}_2\text{C} = \text{CH}_2$ (D) $\text{H}_2\text{C} = \text{C} \begin{array}{l} \text{H} \\ \text{D} \end{array}$

Q.4 Select the species having bond order equal to one

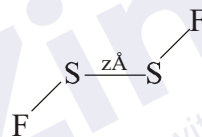
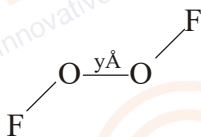
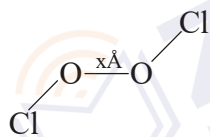
- (A) Li_2 (B) B_2 (C) F_2 (D) All of these

Q.5 $\text{ClCH}_2\text{CHCl}_2 \xrightarrow[\Delta]{\text{alc.KOH}} \text{A (Major Product)}$

A is:

- (A) $\text{CHCl} = \text{CHCl}$ (B) $\text{CH}_2 = \text{CCl}_2$
 (C) $\text{CH} \equiv \text{CH}$ (D) ClCH_2CHO

Q.6 Consider the following structures given below



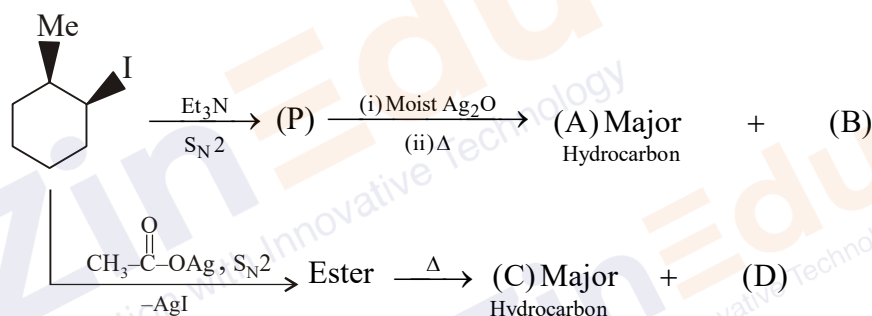
The correct order of $d_{\text{O-O}}$ and $d_{\text{S-S}}$ is

- (A) $x > y > z$ (B) $z > x > y$ (C) $y > x > z$ (D) $z > y > x$

[PARAGRAPH TYPE]

Q.7 to Q.12 has four choices (A), (B), (C), (D) out of which **ONLY ONE** is correct.

Paragraph for question nos. 7 to 9



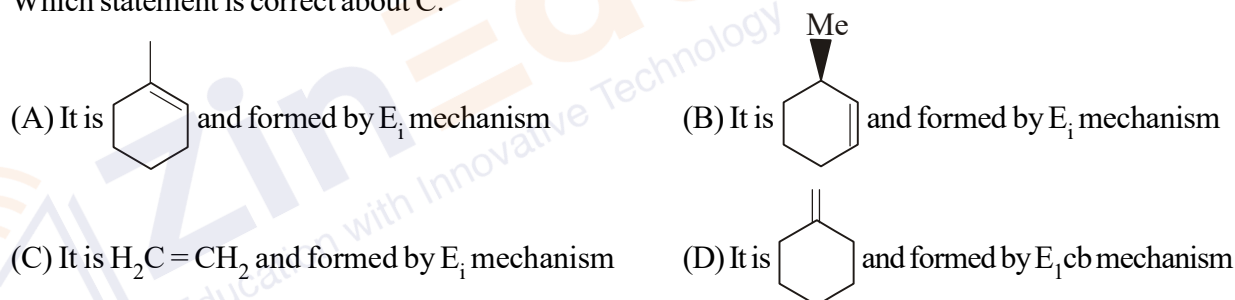
Q.7 P is
 (A) Enantiomeric products
 (C) Optically pure product

(B) Diastereomeric products
 (D) Positional isomeric product

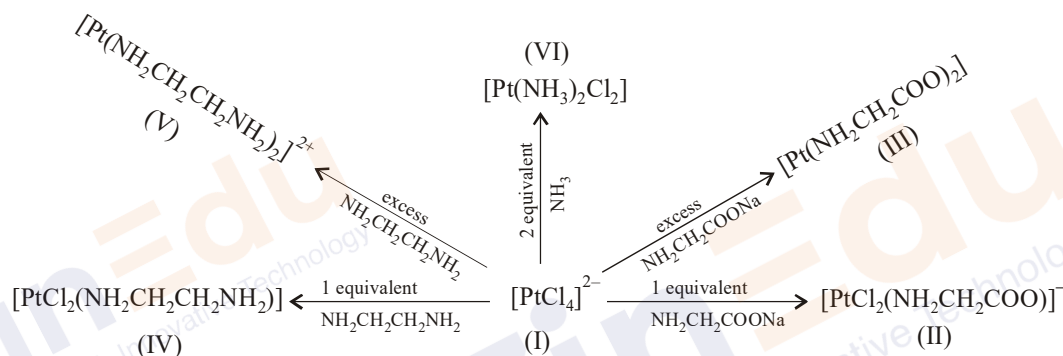
Q.8 Hydrocarbon A is



Q.9 Which statement is correct about C.



Paragraph for question nos. 10 to 12



All these complexes are square planar about Pt^{II} . Square planar complexes show geometrical isomerism provided ligands are proper. A bidentate ligand (like ethylenediamine, glycinate) does not attach itself in anti-position. If the ligands present in square planar complexes do not contain chiral or asymmetric center, such complexes do not show optical isomerism due to presence of plane of symmetry.

- Q.10 Optical isomerism is shown by
 (A) IV (B) V (C) III (D) None of these
- Q.11 Geometrical isomerism is exhibited by
 (A) III, VI (B) III, IV, V (C) III, IV, VI (D) II, IV, VI
- Q.12 Which of the following is not possible?
 (A) trans - $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ (B) cis - $[\text{Pt}(\text{gly})_2]$
 (C) trans - $[\text{PtCl}_2(\text{gly})]^-$ (D) trans - $[\text{Pt}(\text{gly})_2]$

PART-B
[MATRIX TYPE]

Q.1 has four statements (A, B, C, D) given in **Column-I** and five statements (P, Q, R, S, T) given in **Column-II**. Any given statement in **Column-I** can have correct matching with one or more statement(s) given in **Column-II**.

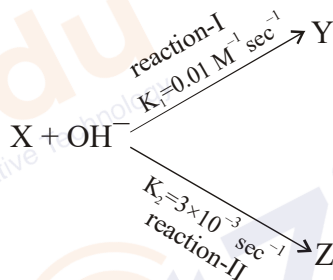
Q.1 The match column I with column II assuming single reactant to be involved.

Column I	Column II
(A) 1 st order reaction	(P) Rate of reaction will decrease with time as the reaction proceeds.
(B) Zero order reaction	(Q) Reaction can get 100% completed in finite time interval.
(C) Order greater than 1	(R) Graph of rate of reaction v/s concentration of reactant will be a straight line.
(D) Negative order	(S) Half life depends on initial concentration
	(T) Rate of reaction will increase with time as the reaction proceeds.

PART-C
[INTEGER TYPE]

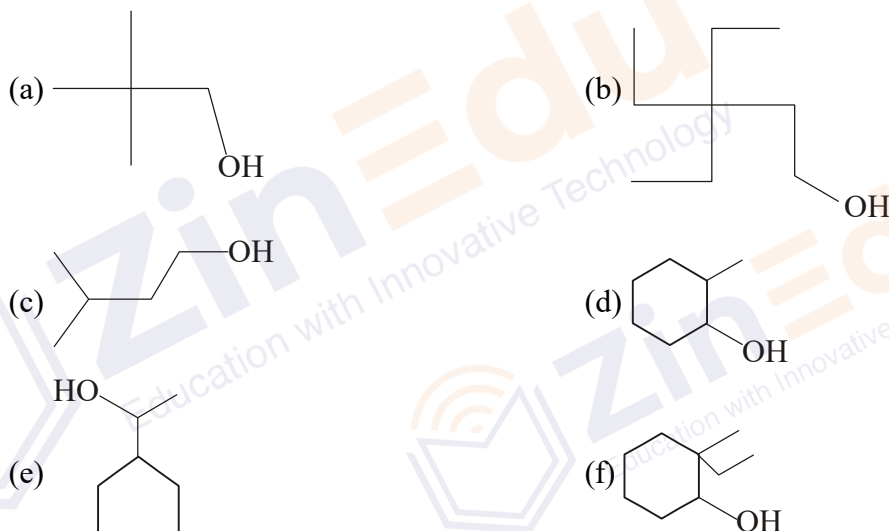
Q.1 to Q.5 are "Integer Type" questions. (The answer to each of the questions **are upto 4 digits**)

Q.1 A substance X in presence of OH^- reacts by two different mechanisms to give two different isomeric products as shown



If rate law is given as $-\frac{d[\text{X}]}{dt} = K_1 [\text{X}][\text{OH}^-] + K_2 [\text{X}]$ and $\Delta H_{\text{reaction-I}} = -40 \text{ kJ}$ and $\Delta H_{\text{reaction-II}} = -28 \text{ kJ}$ then calculate $|\Delta H|$ when 1 mole of X completely reacts [in kJ] if $[\text{OH}^-]$ is maintained at 0.1 M.

Q.2 How many alcohols out of following on dehydration with hot conc. H_2SO_4 will give alkene having 9 α H as major product.



Q.3 Find the sum of optically active isomers of both $[Pt(gly)_2Cl_2]$ and $[Co(en)_2Cl_2]$.

Q.4 A substance has normal boiling point of 400 K. If ΔS_{vap} at 1 atm and 400 K is 100 J/ K mole, then calculate $|\Delta S|_{surrounding}$ at 1 atm and 200 K for the vaporization process.

C_p of substance in liquid phase = 50 J/mole K

C_p of substance in vapour phase = 40 J/mole K

[Express answer in J/K mole]

Q.5 How many monochloro compounds including stereoisomers will give propene on treatment with Mg/ ether followed by H_2O ?

[If the answer is 9 fill 0009 in OMR sheet]













