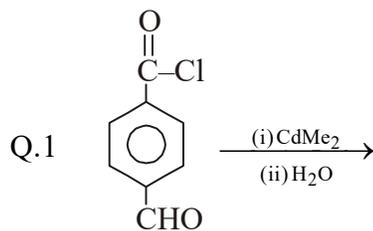
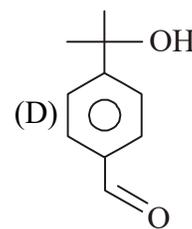
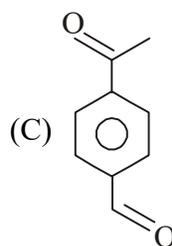
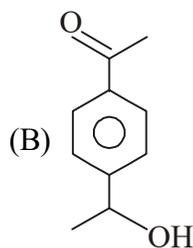
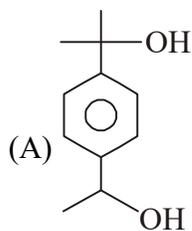


PART-A**[STRAIGHT OBJECTIVE TYPE]**

Q.1 to Q.7 has four choices (A), (B), (C), (D) out of which **ONLY ONE** is correct.



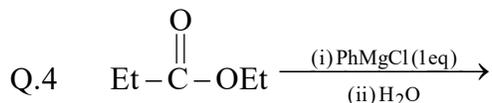
Product is:



ROUGHWORK

- Q.2 Which of the following is correct statement regarding conductance ?
- (A) Conductance of HCl solution increases on adding NaOH, before the equivalent point.
- (B) For potash alum ($K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$), $\Lambda_{eq}^\infty = 8 \cdot \Lambda_m^\infty$
- (C) In general, conductivity increases with increase in concentration
- (D) On increasing the temperature, the conductance of any conductor increases.

- Q.3 The bond angle of H_2Se is best described as being
- (A) Between 109° and 120°
- (B) Greater than 120°
- (C) Less than that in H_2S but not less than 90°
- (D) Less than 90°



True about product of above reaction

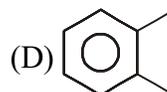
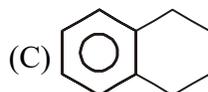
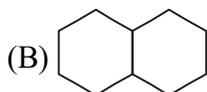
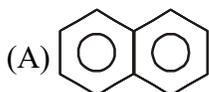
- (A) One of the product will give positive iodoform test
- (B) Product will give CO_2 on heating
- (C) Product will give only one oxime with NH_2OH
- (D) Product will give chiral alcohol with $EtMgBr$ followed by hydrolysis.

ROUGH WORK

- Q.5 Which of the following activity will increase the $[\text{OH}^-]$ of NH_4OH solution ?
 (A) Addition of HCl solution in NH_4OH solution.
 (B) Addition of water in NH_4OH solution.
 (C) Addition of NH_4Cl solution in NH_4OH solution.
 (D) Addition of solid NH_4OH at constant volume to NH_4OH solution

- Q.6 Which of the following complex is inner orbital as well as low spin complex
 (A) $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$ (B) $[\text{Fe}(\text{CN})_6]^{3-}$
 (C) $[\text{Cu}(\text{CN})_4]^{3-}$ (D) $[\text{Mn}(\text{NH}_3)_6]^{2+}$

- Q.7 Which of the following can show Geometrical isomerism?

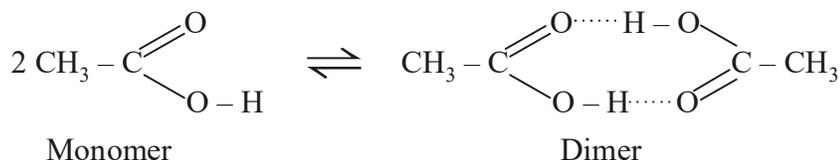


ROUGH WORK

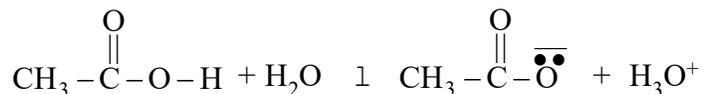
Q.8 to Q.13 are based upon a paragraph. Each question has four choices (A), (B), (C), (D) out of which ONLY ONE is correct.

Paragraph for question nos. 8 to 10

Acetic acid tends to form dimer due to the formation of intermolecular hydrogen bonding.



The equilibrium constant for this reaction is $1.5 \times 10^2 \text{ M}^{-1}$ in benzene solution and $3.6 \times 10^{-2} \text{ M}^{-1}$ in water. In benzene, monomer does not dissociate but in water, monomer dissociates simultaneously with acid dissociation constant $2.0 \times 10^{-5} \text{ M}$.

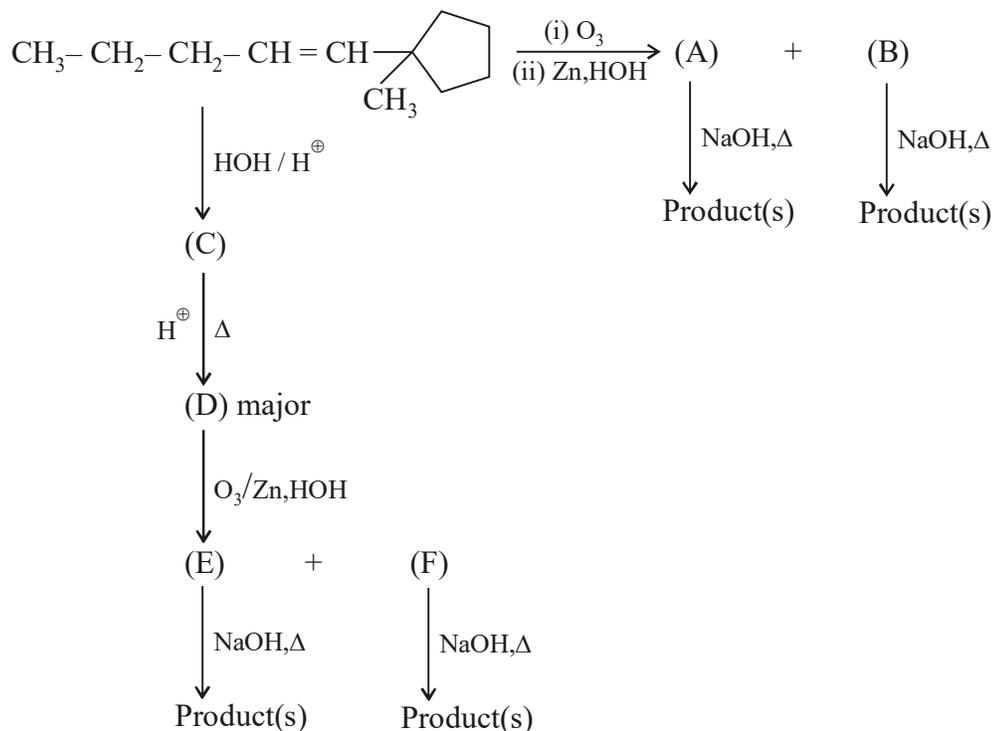


Dimer does not dissociate in benzene as well as in water.

[Given : $\log 2 = 0.3$]

- Q.8 The molar ratio of dimer to monomer for 0.1 M acetic acid in benzene is equal to
 (A) 150 : 1 (B) 1 : 150 (C) 5 : 2 (D) 2 : 5
- Q.9 The molar ratio of dimer to monomer for 0.1 M acetic acid in water (neglecting the dissociation of acetic acid in water) is equal to
 (A) 250 : 1 (B) 1 : 250 (C) 9 : 2500 (D) 2500 : 9
- Q.10 The pH of 0.1 M acetic acid solution in water, considering the simultaneous dimerisation of acid is
 (A) 1 (B) 2.85 (C) 5.7 (D) 3.42

Paragraph for question nos. 11 to 13



- Q.11 Which of the following reaction or reaction mechanism is not involved in above interconversions?
 (A) Electrophilic addition reaction (B) Acid base reaction
 (C) Elimination reaction (D) Free radical combination reaction
- Q.12 Number of ozonide formed during the formation of A & B (Excluding stereo)
 (A) 1 (B) 2 (C) 3 (D) 4
- Q.13 Find out the correct statement.
 (A) In presence of NaOH, A and B give the same type of reaction
 (B) In presence of NaOH, E and F give the same type of reaction
 (C) D is same as starting compound
 (D) Ring size is different in D and starting compound

Q.14 to 16 has four choices (A), (B), (C), (D) out of which ONE OR MORE THAN ONE is/are correct.

- Q.14 The amount of Cu deposited at the cathode in the electrolysis of aqueous CuSO_4 solution in a definite time period depends on (It is given that only Cu is deposited at cathode)
- (A) Electric current strength
(B) Concentration of CuSO_4 solution
(C) Nature of electrodes (Inert or Cu)
(D) Temperature
- Q.15 Which of the following complexes are diamagnetic
- (A) $[\text{AuCl}_4]^-$ (B) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$ (C) $[\text{CoF}_6]^{3-}$ (D) $[\text{Co}(\text{CO})_4]^-$
- Q.16 MeCHO and PhCHO will give different type of reaction with
- (A) NaOI (B) Brady's reagent (C) MeMgBr (D) KOH, Δ

ROUGH WORK

PART-B
[MATCH THE COLUMN]

Q.1 is "Match the Column" type. **Column-I** contains **Three/Four** entries and **column-II** contains **Four/Five** entries. Entry of column-I are to be matched with **one or more than one entries** of column-II or vice versa.

Q.1 Match the column.

Column I

Column II

(Property which is different in given pair)

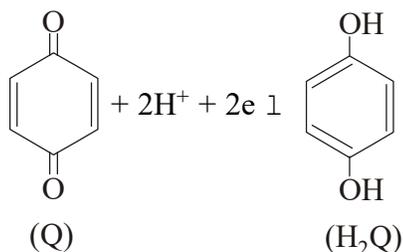
- | | |
|---|--|
| (A) $K_4[Ni(CN)_4]$ and $[Ni(en)_3]S_2O_3$ | (P) Number of unpaired electrons |
| (B) $K_4[NiF_6]$ and $K_2[NiF_6]$ | (Q) Magnetic behaviour (i.e. Para / Dia) |
| (C) $K_4[Co(NO_2)_6]$ and $[Fe(H_2O)_6] Cl_3$ | (R) Hybridisation |
| | (S) Geometry |

ROUGH WORK

PART-C
[SUBJECTIVE]

Q.1 to Q.4 are "Subjective" type questions. (The answer to each of the questions are upto **4 digit**)

- Q.1 Quinhydrone is a sparingly soluble one-to-one addition compound formed from hydroquinone and quinone. When solid quinhydrone is dissolved in an aqueous medium, equal concentrations of hydroquinone and quinone result. If a platinum wire is dipped into the solution, the potential of the electrode is governed by the reversible reaction:



Where Q denotes quinone and H₂Q denotes hydroquinone. The E° value of this half cell reaction is +0.46 V with respect to the saturated calomel reference electrode (SCE). Because the potential of the quinone-hydroquinone half reaction depends on the concentration of hydrogen ion, it is possible to use this system to measure pH. A sample solution of unknown pH was saturated with quinhydrone and a platinum electrode was dipped into it. If the potential of the such electrode was found to be +0.22 V with respect to SCE, what was the pH of the sample solution?

[Given : $\frac{2.303 RT}{F} = 0.06$]

Q.2 From Meridional and facial isomer of $[\text{Ma}_3\text{b}_3]^{n\pm}$ on replacement of only one 'a' by 'b', the number of isomer of the product obtained are _____ and _____ respectively.

[If answer is 2 and 5 represent as 25]

Q.3

- (a) Enthalpy for the reaction $\text{Ag}^+(\text{aq}) + \text{Br}^-(\text{aq}) \longrightarrow \text{AgBr}(\text{s})$ is -84.54 kJ. Magnitude of enthalpy of formation of $\text{Ag}^+(\text{aq})$ and $\text{Br}^-(\text{aq})$ are in the ratio 8 : 9. Formation of $\text{Ag}^+(\text{aq})$ is an endothermic process whereas formation of Br^- is an exothermic process. Enthalpy of formation of AgBr is -99.54 kJ/mol. Calculate the enthalpy of formation of $\text{Ag}^+(\text{aq})$ in kJ/mol.
- (b) The number of corner shared per tetrahedron for 2D-silicate is _____.

If answer of part (a) is x and part (b) is y then present sum of x + y in the OMR sheet.

For example : if Answer of (a) is 32 , (b) is 13 you will fill 0045 in OMR sheet.

Q.4 (a) $\text{CH}_3\text{CHO} + \text{CH}_3\text{COCH}_3 \xrightarrow[5^\circ\text{C}]{\text{dil. KOH}}$ (X) is the number of all aldol products. (Excluding stereo)

(b) $\text{Ph} - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_3 \xrightarrow[\text{dry ether}]{\text{Mg/Hg}}$ (A) $\xrightarrow[\Delta]{\text{conc. H}_2\text{SO}_4}$ (B)

Double bond equivalent value of product B will be.

- (c) How many moles of H_2 are released when one mole of HCOONa undergoes Kolbe's electrolytic method.
- (d) How many monochloro alkenes will give propene on treatment with Mg followed by EtOH. (Including stereo).

Write answer of part (a), (b), (c) & (d) in the same order and present the four digit number as answer in OMR sheet. For example : If all these answer are 9 then fill 9999 in OMR sheet.