KOTHARI INTERNATIONAL SCHOOL, NOIDA

ANNUAL EXAMINATION, SESSION: 2025-26

GRADE: 11 SUBJECT: CHEMISTRY (043)

MARKING SCHEME

SET A

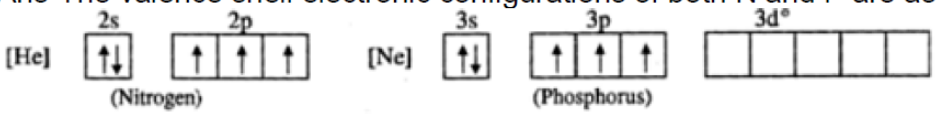
SECTION – A

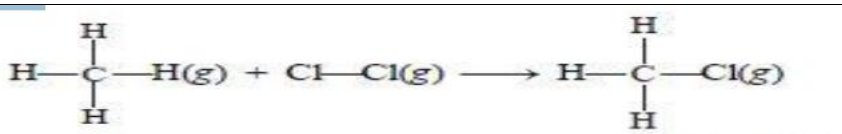
The following questions are multiple -choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

Q1.	Photoelectric effect established that light (A) behaves like particles (B) behaves like magnetic fields (C) behaves like waves (D) behaves like rays Ans: (A) behaves like particles	**(1)**
Q2.	The number of moles of solute present in 1 kg of a solvent is called. (A) Molarity (M) (B) ppm (C) Normality(N) (D) Molality (m) Ans:(D) Molality (m)	**(1)**
Q3.	Lines in the hydrogen spectrum which appear in the infrared region of the electromagnetic Spectrum, are called as: (A) Balmer series (B) Hydrogen line series (C) Hydrogen series (D) Paschen series Ans: (D) Paschen series	**(1)**
Q4.	30 % aqueous solution of glucose (Molar mass 180 g/mL) by mass. The mole fraction of glucose is equal to (A) 0.06 (B) 0.041 (C) 0.02 (D) 0.08 Ans: (B) 0.041	**(1)**
Q5.	The element with atomic number 26 will be found in group : (A) 2 (B) 8	**(1)**

	(C) 6 (D) 10 Ans: (B) 8	
Q6.	The Ionic radius of cation is always——— (A) Less than the atomic radius (B) more than the atomic radius (C) Equal to atomic radius (D) Cannot be predicted Ans: (A) Less than the atomic radius	**(1)**
Q7.	Which of the following correctly represents the increasing order of effective nuclear charge in Na, Al, Mg and Si atoms? (A) Na < Mg < Si <Al (B) Na < Mg <Al < Si (C) Mg < Na <Al< Si (D) Na = Mg =Al = Si Ans: (B) Na < Mg <Al < Si	**(1)**
Q8.	Amongst H_2O, H_2S, H_2Se and H_2Te the one with the highest boiling point is (A) H_2O because of hydrogen bonding (B) H_2Te because of higher molecular weight (C) H_2S because of hydrogen bonding (D) H_2Se because of lower molecular weight. Ans: (A) H_2O because of hydrogen bonding	**(1)**
Q9.	Maximum bond angle is present in case of (A) BBr_3 (B) BCl_3 (C) BF_3 (D) Same in all Ans: (d) Same in all	**(1)**
Q10.	If the bond energies of H—H, Br—Br and H—Br are 433, 192 and 364 kJ mol^{-1}, respectively, then ΔH° for the reaction. $H_2(g) + Br(g) \rightarrow 2HBr\ (g)$ is (A) –261 kJ (B) –103 kJ (C) +261 kJ (D) –1031 kJ Ans : (b) –103 kJ.	**(1)**

	$\Delta H = B_{H-H} + B_{Br-Br} - 2B_{H-Br}$ $= 433 + 192 - 2 \times 364$ $= 625 - 728$ $= -103$ kJ	
Q11.	The correct thermodynamic conditions for the spontaneous reaction at all temperature is: (A) $\Delta H < 0$ and $\Delta S > 0$ (B) $\Delta H < 0$ and $\Delta S < 0$ (C) $\Delta H < 0$ and $\Delta S = 0$ (D) $\Delta H > 0$ and $\Delta S < 0$ Ans: (A) $\Delta H < 0$ and $\Delta S > 0$	**(1)**
Q12.	What is the conjugate base of OH^-? (A) O^{2-} (b) O^- (c) H_2O (d) O_2 Ans: (A) O^{2-}	**(1)**
	For Questions number 13 to 16, two statements are given---- one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A). (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is *not* the correct explanation of the Assertion (A). (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
Q13.	**Assertion**: Lithium is a strong reducing agent. **Reason**: Lithium has lowest value of the standard reduction potential. Ans: (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	**(1)**
Q14.	**Assertion**: The vapour pressure of pure liquid has a fixed value at a particular temperature. **Reason**: When equilibrium is reached, no more vapour are formed. Ans: (C) Assertion (A) is true, but Reason (R) is false.	**(1)**
Q15.	**Assertion** : Benzene on heating with conc. H_2SO_4 and Conc HNO_3 gives nitro benzene. **Reason** : .Mixture of Conc H_2SO_4 and Conc HNO_3 produces electrophile SO_3. Ans: (C) Assertion (A) is true, but Reason (R) is false.	**(1)**

Q16.	**Assertion**: Chain isomerism is observed in compounds containing four or more than four carbon atoms. **Reason**: Only alkanes show chain isomerism. Ans. (C) Assertion (A) is true, but Reason (R) is false.	**(1)**
	SECTION – B ***This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.***	
Q17.	A molecule of PCl_5 exists while that of NCl_5 does not. Explain. Ans: Ans-The valence shell electronic configurations of both N and P are as follows :  Since nitrogen atom has no vacant 2d orbitals, it cannot extend its covalency to five. Therefore, a molecule of NCl_5 does not exist. But in case of phosphorus, an electron can be promoted from 3s filled orbital to 3d vacant orbitals. Therefore, phosphorus can extend its covalency to five. Thus, a molecule of PCl_5 can exist.	**(2)**
Q18.	Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution. Ans: M = 3 mol L^{-1} Mass of NaCl in 1 L solution = 3 × 58.5 = 175.5 g Mass of 1L solution = 1000 × 1.25 = 1250 g (since density = 1.25 g mL^{-1}) Mass of water in solution = 1250 –75.5 = 1074.5 g Molality = No. of moles of solute/Mass of solvent in kg = 3 mol/1.0745 kg = 2.79 m	**(2)**
Q19.	Calculate the bond enthalpy of Cl—Cl bond from the following data: $\mathbf{CH_4(g) + Cl_2(g) \rightarrow CH_3Cl(l) + HCl(l)}$ $[\Delta H = -100.3 \text{ kJ mol}^{-1}]$ Given: bond enthalpies of C—H, C—Cl and H—Cl bonds are 413, 326 and 431 kJ mol^{-1} respectively. Ans :	**(2)**



+ H—Cl(g)

$\Delta H = -100.3$ kJ mol^{-1}

Enthalpy of reaction = Bond energy of reactants − Bond energy of products

$\Delta H = [4 \times$ B.E.(C—H) + B.E.(Cl—Cl)] − [3 × B.E.(C—H) + B.E.(C—Cl) + B.E.(H—Cl)]

ΔH = B.E.(C—H) + B.E.(Cl—Cl)] − B.E.(C—Cl) − B.E.(H—Cl)

$-100.3 = 413 +$ B.E.(Cl—Cl) $- 326 - 431$

or, B.E. (Cl—Cl) $= -100.3 + 326 + 431 - 413$

or, B.E. (Cl—Cl) $= 243.7$ kJ mol^{-1}

Q20. (a) Which distillation method is used to separate a mixture of o-nitrophenol and p-nitrophenol? **(2)**

(b) Name the type of isomerism exhibited by acetone and propanal.

Ans. (a) Steam Distillation

(b) Funtional Isomerim

Q21. ***Attempt either option a or b.*** **(2)**

a. For the equilibrium,

$2NOCl(g) \rightarrow 2NO(g) + Cl_2(g)$

the value of the equilibrium constant, *Kc* is 3.75×10^{-6} at 1069 K. Calculate the *Kp* for the reaction at this temperature?(Given: R = 0.0831Lbar/K/mol)

OR

b. How can you predict the following stages of a reaction by comparing the value of Kc and Qc ?

(i) Net reaction proceeds in the forward direction.

(ii) No net reaction occurs.

Ans:

a.

We know that, $Kp = Kc(RT)^{\Delta n}$

For the above reaction, $\Delta n = (2+1) - 2 = 1$

$Kp = 3.75 \times 10^{-6} (0.0831 \times 1069)$

$Kp = 0.033$

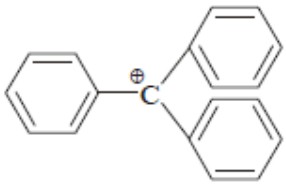
OR

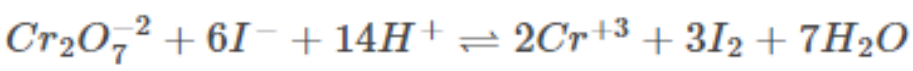
b.

(i) Qc is less than Kc

(ii) Qc is equal to Kc

SECTION – C

This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.		
Q22.	(a) The structure of triphenylmethyl cation is given below. This is very stable and some of its salts can be stored for months. Explain the cause of high stability of this cation.  (b) Why tertiary carbanions are not stable? Explain. Ans: (a)This carbocation is attached with 3 benzene rings which stabilise the positive charge by involving it in their 15 resonating structures. (b) Greater the number of alkyl groups attached to a negatively charged carbon atom, the greater is the +I effect of methyl group then carbanion will be less stable because carbanion is already an electron rich species it doesn't need electrons.	**(3)**
Q23.	***Attempt either option a or b.*** a. A compound on analysis was found to contain C = 34.6%, H = 3.85% and O = 61.55%.Calculate the empirical formula. **OR** b. (i) What is the limiting reagent? (ii) Oxygen is prepared by catalytic decomposition of potassium chlorate ($KClO_3$). Decomposition of potassium chlorate gives potassium chloride (KCl) and oxygen (O_2).If 2.4 mol of oxygen is needed for an experiment, how many grams of potassium chlorate must be decomposed? (At. mass of K = 39, Cl=35.5, O = 16) Ans: (Hints: Step 1 Calculating relative no. in moles for each atom e.g.,C=34.6/12=2.88 H = 3.85 / 1 = 3.85 O = 61.55 / 16 = 3.85 Step-2 Relative whole No. of atoms **C:H:O = 2.88:3.85:3.85 = 1:1.33:1.33=3:4:4** Hence Empirical formula of the compound **$C_3H_4O_4$** **OR** (i) It is the reagent which is entirely consumed when the reaction is about to complete. (ii) $2KClO_3(s) \rightarrow 2KCl(s)+3O_2(g)$ $\therefore$ 3 mol of oxygen requires 2 mol of $KClO_3$. For 2.4 mol of oxygen, we need $=1.6mol$ of $KClO_3$ Therefore, mass of $KClO_3$ required $=1.6mol \times 122.5gmol^{-1} = 196.0g$	**(3)**
Q24.	The first (IE_1) and second (IE_2) ionisation energies (kJ/mol) of a new element designated by Roman numerals are shown below:	**(3)**

	<table><tr><th></th><th>IE_1</th><th>IE_2</th></tr><tr><td>I</td><td>2372</td><td>5251</td></tr><tr><td>II</td><td>520</td><td>7300</td></tr><tr><td>III</td><td>900</td><td>1760</td></tr><tr><td>IV</td><td>1680</td><td>3380</td></tr></table> Which of these elements is likely to be (i) a reactive metal (ii) a reactive non-metal (iii) a noble gas, and Ans: (i) a reactive metal - II (ii) a reactive non-metal - IV (iii) a noble gas - I	
Q25.	Balance the given redox reaction in **<u>acidic medium</u>**.***(Steps of balancing to be shown)***.  Ans: 	**(3)**
Q26.	(i) Write de Broglie equation. (ii) The uncertainty in the position of a moving bullet of mass 10 g is 10^{-5} m. Calculate The uncertainty in its velocity. (Given : h = 6.626×10^{-34} Js). Ans: (i) de Broglie equation: λ= h/mv (symbols have usual significances). (ii) Answer: According to Heisenberg Uncertainty principle : $\Delta x.\ \Delta p \geq h/4\pi$ $\Delta x.\ m(\Delta v) \geq h/4\pi$ Given: h= 6.626×10^{-34} Js , $\Delta x = 10^{-5}$ m , m=10 g =10^{-2} kg . $\Delta v = h / 4\pi m(\Delta x)$ $\Delta v = (6.626 \times 10^{-34})/(4 \times 3.14 \times 10^{-2} \times 10^{-5}) = 5.27 \times 10^{-28}$ ms^{-1} (Ans)	**(3)**
Q27.	Which is most stable out of O^{2+}, O^{2-} & O_2^{2-}.? Explain. Arrange them in increasing order of bond length & bond dissociation energy.	**(3)**

	Ans. Molecular orbital electronic configurations are O_2^+ = (15 e-) $\sigma1s^2\ \sigma^*1s^2\ \sigma2s^2\ \sigma^*2s^2\ \sigma2p_z^2\ (\pi2p_x^2 = \pi\ 2p_y^2)\ (\pi^*2p_x^1 = \pi^*\ 2p_y^0)$ O_2^- = (17e-) $\sigma1s^2\ \sigma^*1s^2\ \sigma2s^2\ \sigma^*2s^2\ \sigma2p_z^2\ (\pi2p_x^2 = \pi\ 2p_y^2)\ (\pi^*2p_x^2 = \pi^*\ 2p_y^1)$ O_2^{2-} = (18 e-) $\sigma1s^2\ \sigma^*1s^2\ \sigma2s^2\ \sigma^*2s^2\ \sigma2p_z^2\ (\pi2p_x^2 = \pi\ 2p_y^2)\ (\pi^*2p_x^2 = \pi^*\ 2p_y^2)$ Bond order of $O_2^+ = \frac{N_b - N_a}{2} = \frac{10-5}{2} = 2.5$ Bond order of $O_2^- = \frac{N_b - N_a}{2} = \frac{10-7}{2} = 1.5$ Bond order of $O_2^{2-} = \frac{N_b - N_a}{2} = \frac{10-8}{2} = 1$ So, Bond order increases $O_2^{2-} < O_2^- < O_2^+$ Hence, O_2^+ is most stable. Bond length: $O_2^+ < O_2^- < O_2^{2-}$ Bond dissociation energy: $O_2^{2-} < O_2^- < O_2^+$	
Q28.	Describe the effect of : (a) addition of H_2 (b) addition of CH_3OH (c) removal of CO on the equilibrium of the reaction: **$2H_2(g) + CO\ (g) \rightarrow CH_3OH\ (g)$** Ans: (a) addition of H_2 the equilibrium will shift to RHS (b) addition of CH_3OH the equilibrium will shift to LHS (c) removal of CO the equilibrium will shift to LHS	**(3)**
	SECTION – D ***The following questions are case -based questions. Each question has an internal choice and carries 4 marks each. Read the passage carefully and answer the questions that follow.***	
Q29.	**Read the passage given below and answer the following questions:** The capacities of shells with a given principal quantum number are fixed by (1) the rules governing the permitted values of the quantum numbers and (2) the Pauli Exclusion Principle. The permitted values of the quantum numbers are: Principal quantum number n 1 to ∞ Azimuthal quantum number l 0 to n–1 (n values) Magnetic quantum number m_l $-l$ to $+l$, ($2l$ +1 values) Spin quantum number m_s – ½ or + ½ (2 values) The Pauli Exclusion Principle states that no two electrons in the same atom may have the same values of all four quantum numbers. It follows that, for a given value of n, there are $2n^2$ different sets of values for the quantum numbers, because l may have the values 0, 1, . . ., n–1, and for each value	**(1×4=4)**

of l there are $2l+1$ values of m_l and for each set of values of l and m there are just two choices for ms.
(Reference : Thomas H. Hazlehurst, J. Chem. Educ. 1941, 18, 12, 580 Publication Date: December 1, 1941, Journal of American Chemical Society).

Answer the following questions on the basis of above data:

(i) Azimuthal quantum number defines:

(A) e/m ratio of electron
(B) spin of electron
(C) angular momentum of electron
(D) magnetic momentum of electron

(ii) What is the maximum number of electrons having n = 3 and l = 2?

(iii)

(a) Write the correct set of quantum numbers(value of n and l) for the unpaired electron of chlorine atom.

(b) The total number of orbitals in a shell having principal quantum number n is

(1) 2n
(2) n^2
(3) $2n^2$
(4) n+1

OR

(iii) (b)Match the following:

	List-I		List-II	List-III
a.	2s	p.	Dough not shape	i. along z-axis
b.	$2p_x$	q.	Spherical	ii. In between x & y-axis
c.	$3d_{xy}$	r.	Dumb bell	iii. non-directional
d.	$3d_{z2}$	s.	Double dumb bell	iv. along x-axis

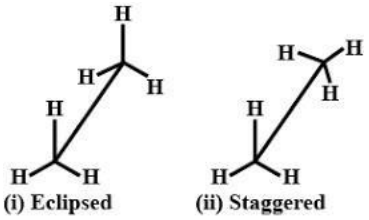
Ans:
(i) (C) Angular momentum of electrons
(ii) 10
(iii) a. n=3 & l=1
b. (2) n^2

OR

(a) (q) (iii), b. (r). (iv), c. (s). (ii), d. (p).(i)

Q30. **Read the passage given below and answer the following questions:** **(1+1+2=4)**

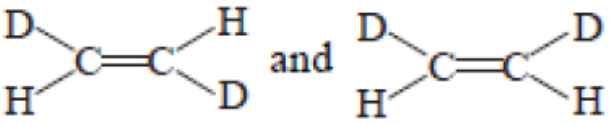
Hydrocarbons are compounds of carbon and hydrogen only, obtained from coal and

	petroleum mainly which are major sources of energy. Hydrocarbons are classified as open chain, saturated (alkanes),unsaturated (alkenes and alkynes), cyclic (alicyclic) and aromatic based on structure. Alkanes show conformational isomerism due to free rotation along C-C bond leading to staggered and eclipsed conformations of ethane. The angle of rotation about C-C bond is called the dihedral angle or torsional angle and is maximum, i.e. 180 0 in staggered conformation and minimum in eclipsed conformation. Thus, torsional strain is minimum in staggered conformation and maximum in eclipsed form. The two forms differ in energy by 12.5kJ mol-1. This energy barrier is so small that small thermal or kinetic energy is sufficient to overcome it by intermolecular collisions. Alkenes show geometrical (Cis-trans) isomerism due to restricted rotation around carbon-carbon double bond. **Answer the following questions on the basis of above data:** (a) Which conformation of ethane is relatively more stable? (b) Alkanes show conformational isomerism but alkenes do not .Why? (c) Draw Sawhorse's projections of ethane ? **OR** (c) Why is trans but-2-ene has higher melting point than cis but-2-ene? Ans: (a) The staggered conformation is most stable because the hydrogens and bonding pairs Of electrons are at maximum distance, thus causing minimum repulsion (b) In alkanes there is free rotation in Carbon-Carbon single bond but Free rotation is not possible in alkenes (c)  (i) Eclipsed (ii) Staggered Sawhorse projections of ethane **OR** (c) The melting point of trans but-2-ene is generally higher than that of cis isomers because in trans isomer,bulky groups lie on the opposite side of the double bond. Therefore, the molecule is symmetrical and hence packed well in the crystal lattice.	
	SECTION E ***The following questions are long answer type and carry 5 marks each. All questions have an internal choice.***	
Q31.	***Attempt either option A or B.*** A. Attempt ***any five*** of the following:	**(1×5=5)**

(a) Arrange the following: [***Increasing order of stability***]

(*i*) $(CH_3)_3\overset{\oplus}{C}$, $CH_3CH_2\underset{\displaystyle CH_3}{\overset{\oplus}{C}}H$, $CH_3CH_2CH_2\overset{\oplus}{C}H_2$

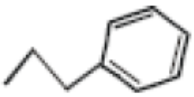
(b)What is the relation between the following pairs?



(c) Identify(underline the atom) electrophilic centers in the following CH_3CHO and CH_3CN.

(d) Name a suitable technique of separation of the components from a mixture of Calcium sulphate and camphor.

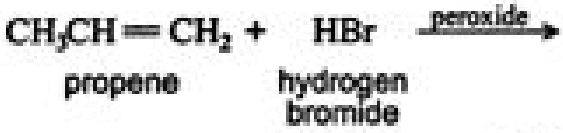
(e) Give the IUPAC name of the following compounds:

(*i*)  (*ii*) 

(f) Draw possible isomers of the compound CH_2ClCH_2CHO

OR

B. (i) Complete the following reaction:



(ii) Name the intermediate that gets formed in the reaction.

(iii) Outline the detailed mechanism for the above reaction indicating the major and minor product.

Ans:

(1+1+3=5)

Attempt any five of the following:

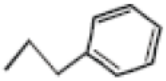
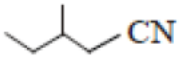
(a) $CH_3CH_2CH_2CH_2^+ < CH_3CH_2(CH_3)CH^+ < (CH_3)_3C^+$

(b)These compounds are geometrical isomers.

(c) Electrophilic center in CH_3CHO is **C**=O and in CH_3CN is **C**N

(d) Sublimation

(e) Give the IUPAC name of the following compounds:

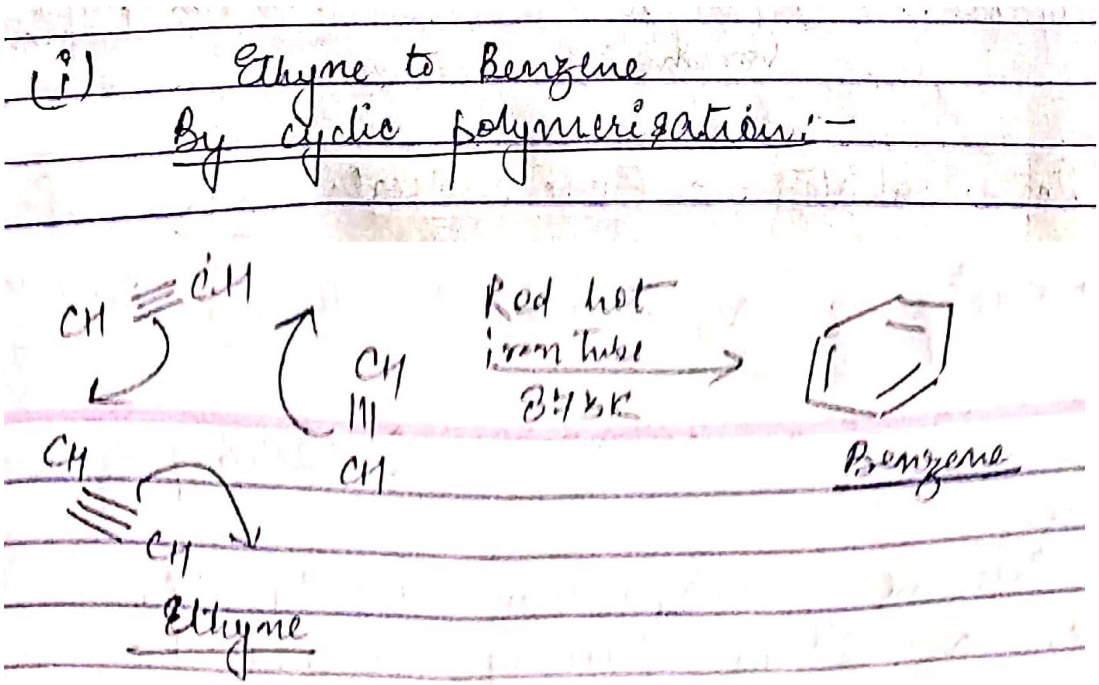
(*i*)  (*ii*) 

(i) Propyl benzene (ii) 3-methyl pentane nitrile

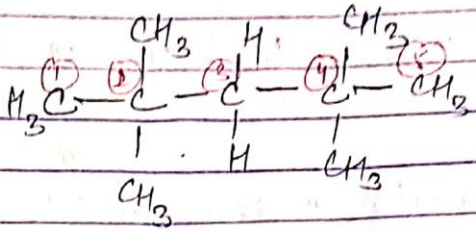
(f) Draw possible isomers of the compound CH_2ClCH_2CHO

$CH_3CHClCHO$, CH_3CH_2COCl, CH_3COCH_2Cl

OR

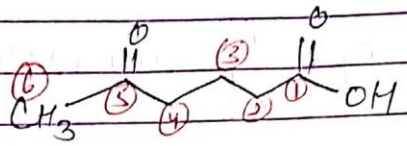


(ii) (a) $(CH_3)_3C-CH_2-C(CH_3)_3$



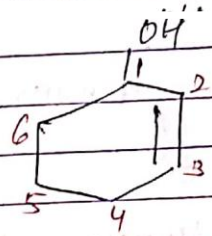
2, 2, 4, 4 tetramethyl pentane

(b)



5-oxohexanoic acid.

(iii) Cyclohex-2-en-1-ol.



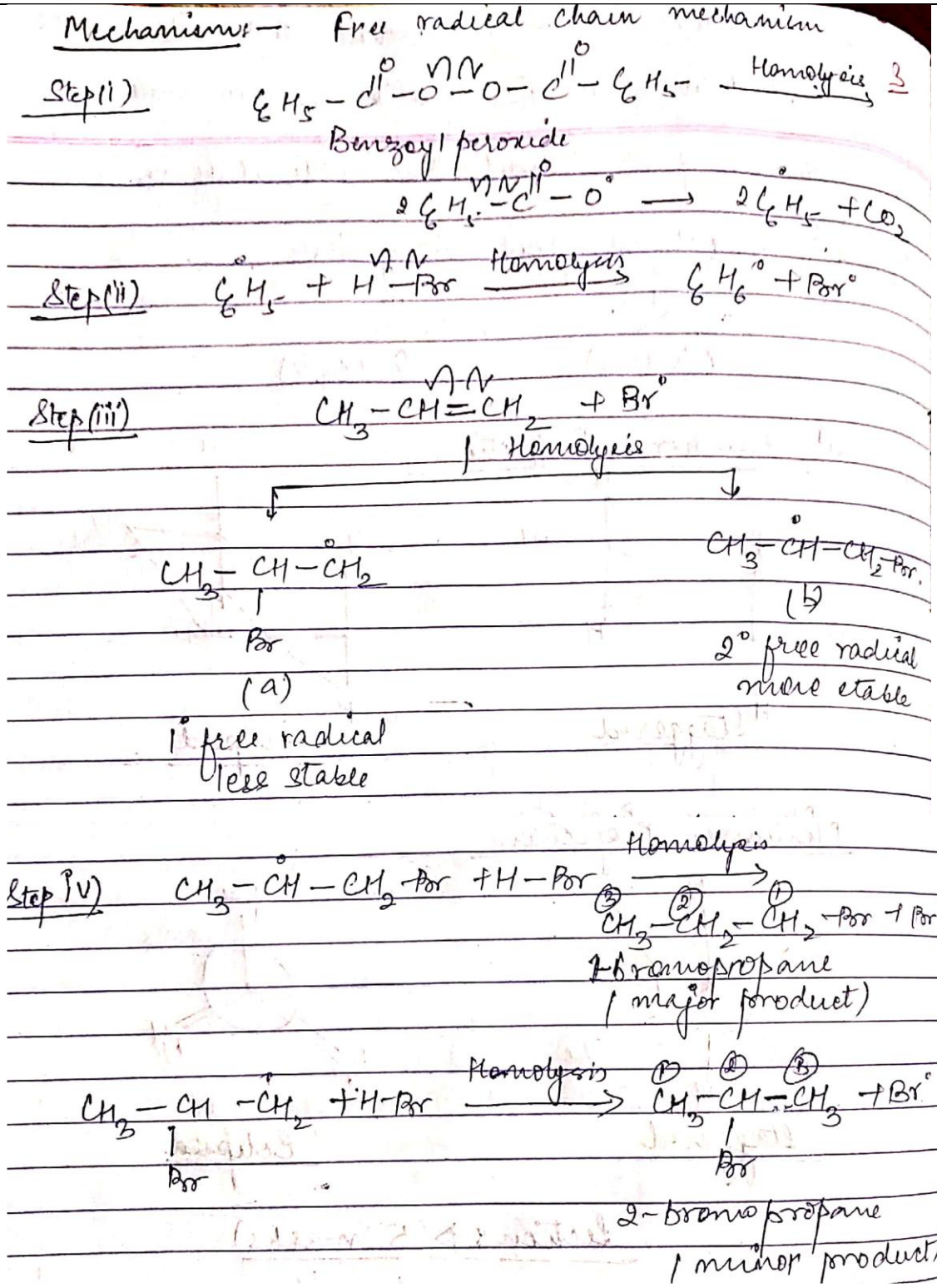
(iv) $CH_3O-OCH_3 \xrightarrow{\text{Homolysis}} CH_3O^{\cdot} + CH_3O^{\cdot}$ ½ + ½

OR

(i) $CH_3CH=CH_2 + HBr \xrightarrow{\text{peroxide}} CH_3-CH_2-CH_2Br$

Propene — Hydrogen bromide — 1-Bromopropane.

(ii) Intermediate → Free radical.



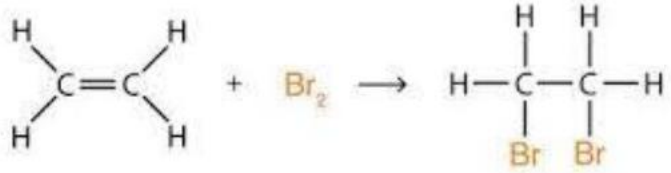
Q32.	***Attempt either option A or B.*** A. What is meant by entropy? Predict the sign of entropy change in each of the	**(1×5=5)**

	following: (*i*) H_2 (at 298 K, 1 atm) $\longrightarrow$ H_2 (at 298 K, 10 atm) (*ii*) H_2O (at 298 K, 1 atm) $\longrightarrow$ H_2O (at 330 K, 1 atm) (*iii*) $2NH_4NO_3(s) \longrightarrow 2N_2(g) + 4H_2O(g) + O_2(g)$ **(iv) Crystallization of copper sulphate from its saturated solution** (*v*) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$. **OR** B. (i) State Hess's law. (ii) For the reaction: $2A(g) + B(g) \longrightarrow 2D(g)$ $\Delta U° = -10.5$ kJ and $\Delta S° = -44.1$ J K^{-1} mol^{-1} Calculate $\Delta G°$ for the reaction and predict whether the reaction may occur spontaneously. **Ans : Entropy is defined as the degree of randomness or disorder** (*i*) ΔS = –ve (*ii*) ΔS = +ve (*iii*) ΔS = +ve (*iv*) ΔS = –ve (*v*) ΔS = –ve **OR** **Hess's Law: The total amount of heat evolved or absorbed in a reaction is the same whether the reaction takes place in one step or in number of steps. In other words, the total amount of heat change in a reaction depends only upon the reactants and the products and is independent of the path taken.** $\Delta H° = \Delta U° + \Delta n_g RT$ $\Delta H° = (-10500 - 2477.57)$ J mol^{-1} $= -12977.575$ J mol^{-1} $\Delta G° = \Delta H° - T\Delta S°$ $= -12977.58 - 298K \times (-44.1)$ JK^{-1} mol^{-1} $= -12977.58 + 13141.80$ $\Delta G° = 0.164$ kJ mol^{-1} $\Rightarrow$ Since $\Delta G°$ is positive, the process is non-spontaneous.	**(2+3=5)**
Q33.	***Attempt either option A or B.***	**(1×5=5)**

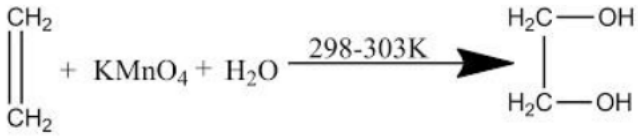
	A. (i) Give reason for following (a) Ethyne is more acidic than ethane. (b) Nitration of Toluene give ortho and para nitro toluene but not m-Nitro toluene. (ii) Complete the following equations: a) $CH_3CH(Cl)\text{-}CH_2\text{-}CH_3 \xrightarrow{Alc\ KOH}$ b) $CaC_2 + 2H_2O \longrightarrow$ (iii) Give a chemical test to distinguish the following pairs: Ethene and Ethyne **OR** B. (i) Write chemical equation for lab preparation of ethene. (ii) What happens: (a) when ethene is passed through Br_2 water.(***Give chemical equation***) (b) Ethene is oxidized in presence of Alk $KMnO_4$.(***Give chemical equation***) (iii) Convert the following: (a) Ethyne to Propyne (b) Benzene to Acetophenone Ans: A. a) In ethyne, the hybridization of each carbon is sp which has 50 % s -character and is more electronegative. Therefore, the acidity order should be, ethyne>ethene. b) In Toluene, $-CH_3$ group attached to benzene ring causes +R effect and activates the benzene ring.ie- increases the electron density at ortho and para position. (ii) a) $CH_3CH(Cl)\text{-}CH_2\text{-}CH_3 \xrightarrow{Alc\ KOH} CH_3CH{=}CH\text{-}CH_3$ (Major product) + HCl b) $CaC_2 + 2H_2O \longrightarrow HC \equiv C{-}H + Ca(OH)_2$ (ii). Ethene is an unsaturated compound and ethane is a saturated compound. Ethene will react with bromine water and will decolourise bromine water but ethane will not. The reaction is : $CH_2{=}CH_2 + Br_2 \longrightarrow CH_2Br{-}CH_2Br$ $CH_3{-}CH_3 + Br_2 \longrightarrow$ No reaction **OR** B.	**(1×5=5)**

Answer-(i) $CH_3\text{-}CH_2OH \xrightarrow{Conc\ H2SO4\ /Heat} C_2H_4 + H_2O$

a) Ethene reacts with bromine to form colorless 1,2-dibromoethane.



Ethylene | Bromine (brownish-red) | 1,2-Dibromoethane (colorless)



Ethylene | ethane-1,2-diol

(ii) (a) Ethyne to Propyne

$H\text{–}C\equiv C\text{–}H + NaNH_2 \longrightarrow H - C \equiv C - Na + NH_3$

Ethyne | Sodium acetylide

$H\text{–}C\equiv \overset{-}{C}\ \overset{+}{Na} + CH_3Br \longrightarrow H\text{–}C\equiv C\text{–}CH_3 + NaBr$

Propyne

(b) Benzene to Acetophenone

$C_6H_6 + CH_3COCl \xrightarrow{Anhyd\ AlCl3} C_6H_5COCH_3$