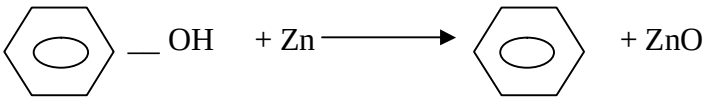
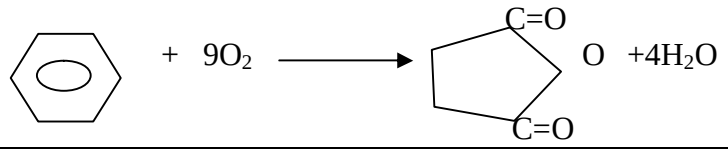
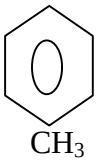
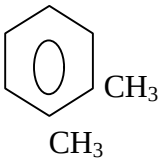
Important Instructions to examiners:

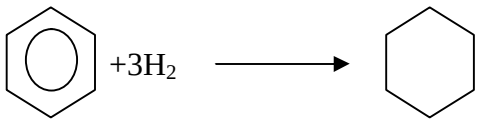
1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills.
4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q No.	Answer	marks	Total marks
1-a	i)amides ii)amines	1 1	2
1-b	$C_nH_{2n+2} + (3n+1)/2\ O_2 \longrightarrow {}_nCO_2 + (n+1)H_2O + \Delta$	2	2
1-c	Substance used in titrations to indicate the completion of a chemical reaction, usually by a change of colour. **Ex.** substance, such as litmus, that indicates the presence of an acid or alkali. Phenolphthalein indicator,methyl orange,starch etc.	1 ½ each for one ex.	2
1-d	Alcohols containing one hydroxyl group are called **Monohydric alcohol.** Ex.CH_3CH_2OH Alcohols containing two ,three or more hydroxyl groups are known as **di hydric, trihydric, and polyhydric** alcohols respectively. Ex. CH_2OH CH_2OH I I CH_2OH CH_2OH I CH_2OH Dihydric alcohol trihydric alcohol	 1 1	2
1-e	By heating phenol with zinc dust ,benzene is formed  PHENOL BENZENE	2	2
1-f	**Raoult's Law Definition:** Raoult's Law is a law that relates the vapour pressure	2	2

	of a solution is dependent on the mole fraction of a solute added to solution. Raoult's Law is expressed by $P_{solution} = X_{solvent}P^0_{solvent}$ where $P_{solution}$ is the vapor pressure of the solution $X_{solvent}$ is mole fraction of the solvent $P^0_{solvent}$ is the vapor pressure of the pure solvent If more than one solute is added to the solution, each individual solvent's component is added to the total pressure.		
1-g	Benzene undergoes oxydation with air/oxygen in the presence of vanadium pentaoxide (V_2O_5) at 450^0c to form maleic anhydride.  	1 1	2
1-h	(i) Methanal (ii) Ethanoic acid	1 1	2
1-i	The **aromatic compounds** stands for the whole series of compounds which contain one or more benzene rings in their molecule.The precise definition of aromatic compounds may be given as arenes and their derivatives which possess fraganant odour	2	2
1-j	Toluene  xylene  	1 mark each	2

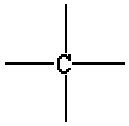
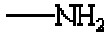
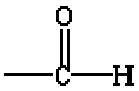
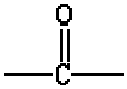
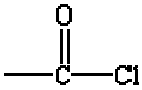
1-k	A compound having two halogen atoms on adjacent carbon atom is called vicinal dihalide.	2	2
1-l	In the presence of Ni,Pt orPd ,acetylene adds up two molecule of hydrogen forming ethane. $CH = CH + H_2 \longrightarrow CH_2 = CH_2 \longrightarrow CH_3\text{-}CH_3$	2	2
2-a	**Vapor pressure**: Force exerted by the gas or vapor released by a liquid or solid substance in a closed container or space. Vapor pressure is a relative measure of the tendency to evaporate depends on the nature of the substance and temperature, and reaches a state of equilibrium (where no more vapor escape from the substance) in closed spaces. Often expressed as (PSI), it is stated usually in (mmHg) at 68°F (20°C) in a MSDS. Vapor pressure depends on various factors, 1) the most important of which is the nature of the liquid. If the molecules of liquid bind to each other very strongly, there will be less tendency for the molecules to escape as gas and a consequent lower vapor pressure; for example, polar molecules that can form hydrogen bonds between themselves, e.g., water molecules and the alcohols, have relatively low vapor pressures. If there is only weak interaction between the liquid molecules, there will be a greater tendency for the molecules to evaporate and a higher vapor pressure. 2) Another factor affecting vapor pressure is the presence of dissolved substances in the liquid or solid; according to Roult'slaw, the vapor pressure of a pure liquid or solid is lowered by the addition of a solute	2 2	4
2-b	IUPAC Rules for naming monofunctional compounds: 1) Identify the principal functional group. 2) Number the longest chain containing the functional group from the end closer to it.	1 mark each for any 4	4

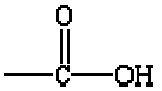
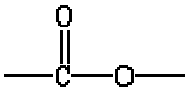
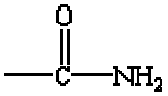
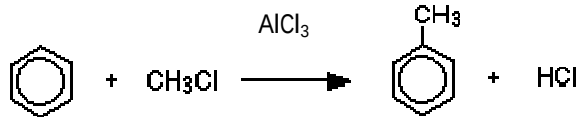
	3) Write the parent name corresponding to the number of carbons in the longest chain. 4) arrange the substituent names with position numbers in alphabetic order 5) Prefix substituent's name with the parent name.		
2-c	**Methods of preparation of alcohols:** i) **hydrolysis of alkyl halides**: alkyl halides reacts with aqueous sodium hydroxide to form alcohols. $R\text{-}X + NaOH \longrightarrow R\text{-}OH + NaX$ ii**) hydration of alkenes**: alkenes reacts with sulphuric acids to produce alkyl hydrogen sulphide. on further hydrolysis it gives alcohols. $CH_3\text{-}CH{=}CH_2 + HOSO_3H \longrightarrow CH_3\text{-}\underset{\underset{OSO_3H}{|}}{CH}\text{-}CH_3$ $CH_3\text{-}\underset{\underset{OSO_3H}{|}}{CH}\text{-}CH_3 + H_2O \longrightarrow CH_3\text{-}\underset{\underset{OH}{|}}{CH}\text{-}CH_3 + H_2SO_4$ iii**) hydrolysis of esters**: alcohols may be prepared by base or acid catalysed hydrolysis of esters. $R'\text{-}\overset{\overset{O}{\|}}{C}\text{-}OR + H\text{-}OH \longrightarrow R'\text{-}\overset{\overset{O}{\|}}{C}\text{-}OH + R\text{-}OH$ iv**) fermentation of carbohydrates**: some alcohols can be prepared by fermentation of starches and sugars under the influence of suitable microorganisms $C_6H_{12}O_6 + \text{YEAST} \longrightarrow 2CH_3CH_2OH + 2CO_2$	2marks each for any 2	4

2-d	Saturated i) Compounds of carbon and hydrogen whose adjacent carbon atoms contain only one carbon-carbon bond are known as saturated hydrocarbons. ii) all the four bonds of carbon are fully utilized and no more hydrogen or other atoms can attach to it. These saturated hydrocarbons are called alkanes. iii) saturated hydrocarbons are called alkanes. The general formula for an alkane is C_nH_{2n+2}.	Unsaturated i)Compounds of carbon and hydrogen that contain one double bond between carbon atoms (carbon=carbon) or a triple bond between carbon atoms (carbon≡carbon) are called unsaturated hydrocarbons. ii) all the bonds of carbon are not fully utilized by hydrogen atoms, more of these can be attached to them. Thus, they undergo addition reactions (add on hydrogen) as they have two or more hydrogen atoms less than the saturated hydrocarbons (alkanes). iii) Unsaturated hydrocarbons can be divided into 'alkenes' and 'alkynes' depending on the presence of double or triple bonds respectively. The general formulae are C_nH_{2n} for alkenes and C_nH_{2n-2} for alkynes.	4	4
2-e	Benzene reacts with hydrogen in the presence of nickel catalyst at 150^0c under pressure to form cyclohexane.  BENZENE CYCLOHEXANE		2 2	4

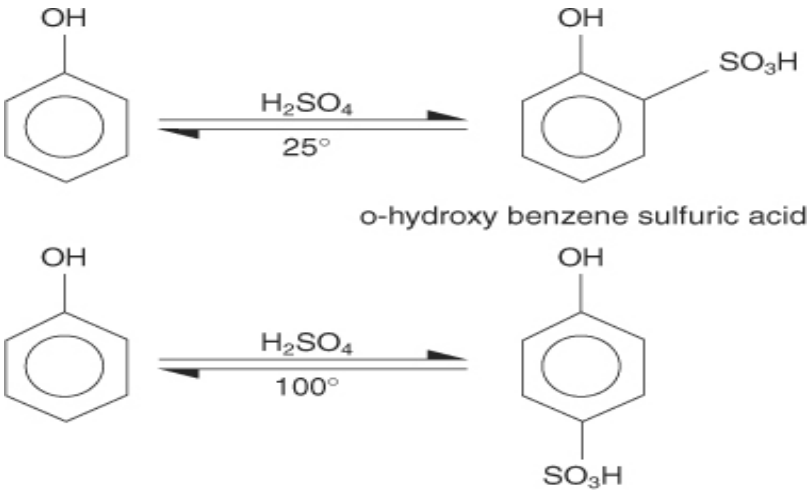
2-f	Ostwald's theory According to this theory: (a) The colour change is due to ionisation of the acid-base indicator. The unionised form has different colour than the ionised form. (b) The ionisation of the **indicator** is largely affected in acids and bases as it is either a weak acid or a weak base. In case, the **indicator** is a weak acid, its ionisation is very much low in acids due to common H+ ions while it is fairly ionised in alkalies. Similarly if the **indicator** is a weak base, its ionisation is large in acids and low in alkalies due to common OH- ions. Considering two important indicators **phenolphthalein** (a weak acid) and **methyl orange** (a weak base), Ostwald theory can be illustrated as follows: **Phenolphthalein**: It can be represented as HPh. It ionises in solution to a small extent as: HPh ↔ H+ + Ph- ColourlessPink K = [H+][Ph-]/[HpH] The undissociated molecules of **phenolphthalein** are colourless while Ph- ions are pink in colour. In presence of an acid the ionisation of HPh is practically negligible as the equilibrium shifts to left hand side due to high concentration of H+ ions. Thus, the solution would remain colourless. On addition of alkali, hydrogen ions are removed by OH- ions in the form of water molecules and the equilibrium shifts to right hand side. Thus, the concentration of Ph- ions increases in solution and they impart pink colour to the solution .	2 2	4

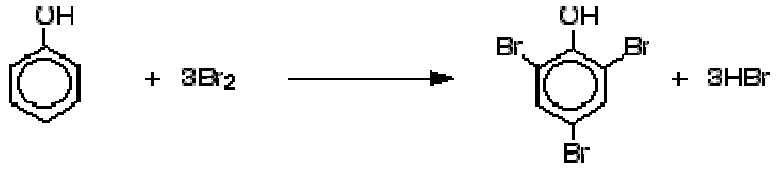
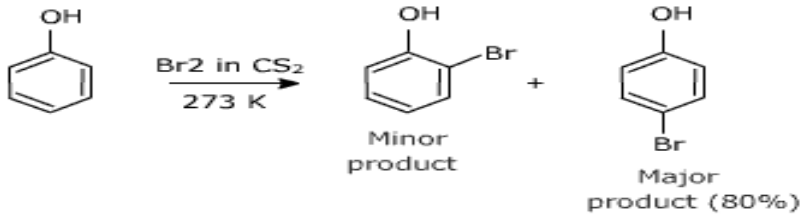
3-a	**Organic compound:** An **organic compound** is any member of a large class of gaseous, liquid, or solid chemical compounds whose molecules contain carbon. (Any 2 functional groups)	2 1mark each for any 2	4

Functional Group	*Name*	*Example*
	Alkane	$CH_3CH_2CH_3$ (propane)
	Alkene	$CH_3CH{=}CH_2$ (propene)
	Alkyne	$CH_3C{\equiv}CH$ (propyne)
F, Cl, Br, or I	Alkyl halide	CH_3Br (methyl bromide)
	Alcohol	CH_3CH_2OH (ethanol)
	Ether	CH_3OCH_3 (dimethyl ether)
	Amine	CH_3NH_2 (methyl amine)
	Aldehyde	CH_3CHO (acetaldehyde)
	Ketone	CH_3COCH_3 (acetone)
	Acyl chloride	CH_3COCl (acetyl chloride)

	 Carboxylic acid CH_3CO2H (acetic acid)  Ester $CH_3CO_2CH_3$ (methyl acetate)  Amide CH_3NH_2 (acetamide)		
3-b	**Grignard reagent** Alkyl(or aryl)magnasium halaid is known as Grignard reagent.Alkyl halides react with magnesium metal in diethyl ether (Et_2O) to form compounds that contain a metal-carbon bond. Methyl bromide, for example, forms methylmagnesium bromide. $CH_3Br + Mg \xrightarrow{Et_2O} CH_3MgBr$ A Grignard reagent has a formula RMgX where X is a halogen, and R is an alkyl or aryl (based on a benzene ring) group. **Reaction for manufacturing of Methane from Grignard reagent**: Methane can be prepared by the hydrolysis of "Methyl Magnesium Iodide". CH_3-Mg-I + HOH $\longrightarrow$ CH_4 + Mg-I-OH	2 2	4
3-c	**Friedel crafts reaction for manufacturing of toluene**  Benzene Methyl Chloride Toluene **OR**	2	4

$AlCl_3$

	$C_6H_6 + CH_3Cl \longrightarrow C_6H_5CH_3 + HCl$ Benzene Methyl Chloride Toluene **Wurtz fittig reaction for manufacturing of toluene** $C_6H_5Br + CH_3Br + 2Na \longrightarrow C_6H_5CH_3 + 2NaBr$ Benzene Bromide Methyl Bromide Toluene	2	
3-d	**i) Sulphonation of phenol:**  o-hydroxy benzene sulfuric acid **i) Halogenation of phenol:** **Reaction with bromine water**	2 2	4

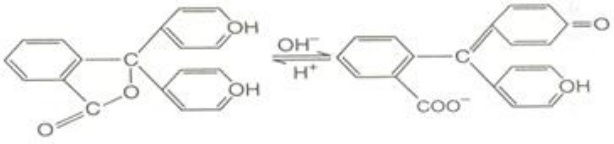
	 **2,4,6-tribromophenol** **Reaction with bromine** 		
3-e	**Uses of phenol : (any four uses)** 1) The main use of phenol is as a feedstock for phenolic resins, bisphenol A and caprolactam (an intermediate in the production of nylon-6). 2) It is used in the manufacture of many products including insulation materials, adhesives, lacquers, paint, rubber, ink, dyes, illuminating gases, perfumes, soaps. 3) Also used in embalming and research laboratories. It is a product of the decomposition of organic materials, liquid manure, and the atmospheric degradation of benzene. 4) It is found in some commercial disinfectants,antiseptics, lotions and ointments. 5) Phenol is active against a wide range of microorganisms, and there are some medical and pharmaceutical applications including topical anaesthetic and ear drops, sclerosing agent. 6) It is used in dermatology for chemical face peeling	1 mark each for any 4	4

3-f	**Ideal solutions**	**Non-ideal solutions**		(Any four points) Each carry 1 marks	4
		Positive deviation from Raoult's law	**Negative deviation from Raoult's law**		
	1.Obey Raoult's law at every range of concentration.	1. Do not obey Raoult's law.	1. Do not obey Raoult's law.		
	2. $\Delta H_{mix} = 0;$ neither heat is evolved nor absorbed during dissolution.	2. $\Delta H_{mix} > 0.$ Endothermic dissolution; heat is absorbed.	2. $\Delta H_{mix} < 0.$ Exothermic dissolution; heat is evolved.		
	3. $\Delta V_{mix} = 0;$ total volume of solution is equal to sum of volumes of the components.	3. $\Delta V_{mix} > 0.$ Volume is increased after dissolution.	3. $\Delta V_{mix} < 0.$ Volume is decreased during dissolution.		
	4. $P = p_A + p_B = p_A^0 X_A + p_B^0 X_B$ i.e., $p_A = p_A^0 X_A : p_B = p_B^0 X_B$	4. $p_A > p_A^0 X_A;$ $p_B > p_B^0 X_B$ $\therefore$ $p_A + p_B > p_A^0 X_A + p_B^0 X_B$	4. $p_A < p_A^0 X_A;$ $p_B < p_B^0 X_B$ $\therefore$ $p_A + p_B < p_A^0 X_A + p_B^0 X_B$		
	5. $A-A, A-B, B-B$ Interactions should be same, i.e., 'A' and 'B' are identical in shape, size and character.	5. $A-B$ Attractive force should be weaker than $A-A$ and $B-B$ attractive forces. 'A' and 'B' have different shape, size and character.	5. $A-B$ Attractive force should be greater than $A-A$ and $B-B$ attractive forces. 'A' and 'B' have different shape, size and character.		
	6. Escaping tendency of 'A' and 'B' should be same in pure liquids and in the solution.	6. 'A' and 'B' escape easily showing higher vapour pressure than the expected value.	6. Escaping tendency of both components 'A' and 'B' is lowered showing lower vapour pressure than expected ideally.		
	7.Examples: benzene + toluene: n-hexane + n-heptane;	7. Examples: Acetone +ethanol	7. Examples: Acetone + aniline;		
4-a	**Quinonoid theory** According to quinonoid theory, an **acid-base indicators** exist in two tautomeric forms having different structures which are in equilibrium. One form is termed benzenoid form and the other quinonoid form.			4	4

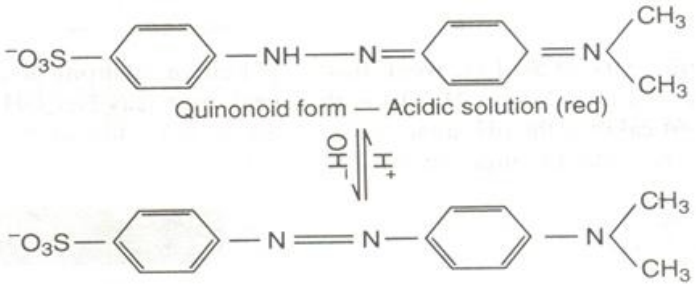
The two forms have different colors. The color change is due to the interconversation of one tautomeric form into other. One form mainly exists in acidic medium and the other in alkaline medium.

Thus, during **titration** the medium changes from acidic to alkaline or vice-versa. The change in pH converts one tautomeric form into other and thus, the colour change occurs.

Phenolphthalein has benziod form in acidic medium and thus, it is colourless while it has quinonoid form in alkaline medium which has pink colour.

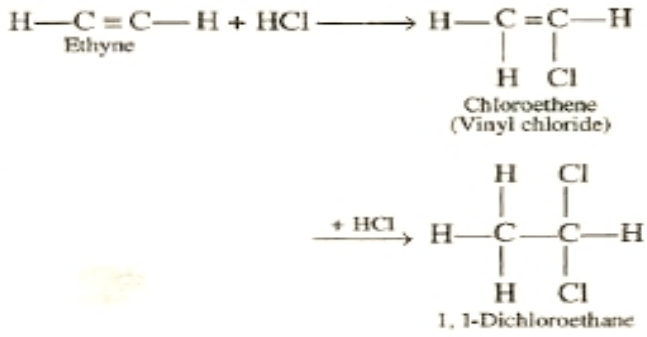
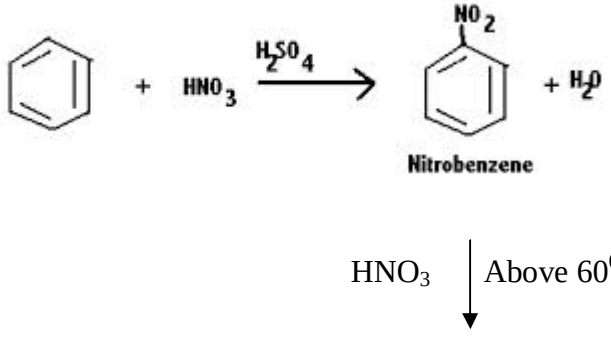


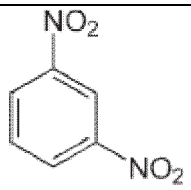
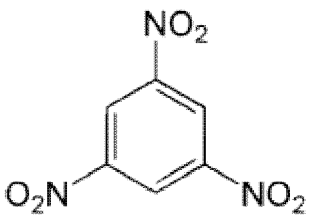
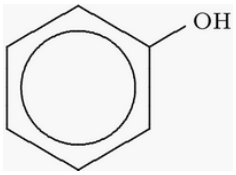
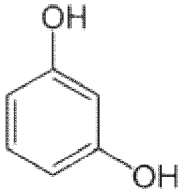
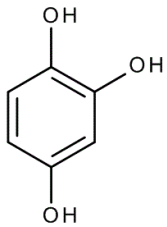
Methyl orange has quinonoid form in acidic solution and benzenoid form in alkaline solution. The color of benzenoid form is yellow while that of quinoniod form is red

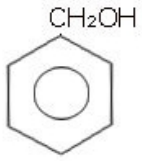
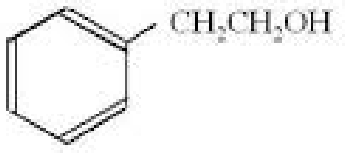


4-b	**Organic Compounds**	**Inorganic Compounds**	1 mark each for any 4	4
	1) Usually always contain carbon, especially carbon-hydrogen bonds	1) May contain carbon. Contain metal and other elements. Does		

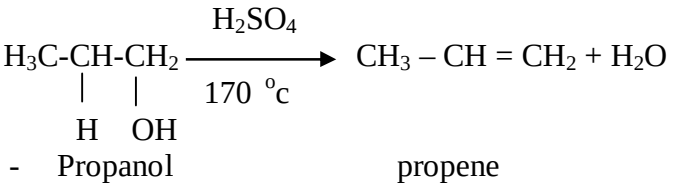
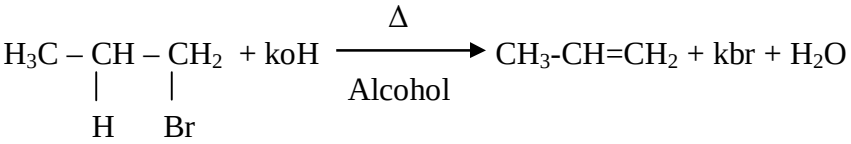
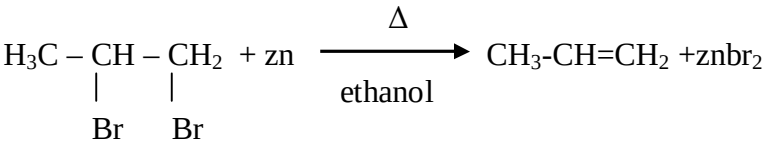
		not contain carbon-hydrogen bonds.		
	2) Generally found in living matter, i.e., animals and plants.	2) Generally obtained from non-living matter, i.e., minerals.		
	3)Lower melting and boiling points	3)Higher melting and boiling points		
	4)Insoluble in water, soluble in organic solvents	4)Readily soluble in water, insoluble in organic solvents		
	5)Highly inflammable and volatile	5)Not inflammable and non – volatile		
	6)Poorer conductors of heat and electricity in aqueous solutions	6)Better conductors of heat and electricity in aqueous soluions		
	7)Produces more complex set of products during reaction	7)Produces less complex set of products during reaction		
	8)Classified into many classes on the basis of functional groups, known as homologous series. Each class is represented by a general formula and the members show similar properties.	8)Classified as acids, bases and salts. No homologous series found		
	9)Examples: methane, ethane, acetylene, alcohols, carbon tetrachloride (CCl4), urea	9)Examples: carbon dioxide, sulphuric acid, NaCl, diamond (pure carbon)		
4-c	**Physical properies of Alkane:** 1) First four members(C1 to C4) of alkane are gases,next thirteen members (C5 to C17) are colourless liquids and higher alkanes are solids. 2) Liquid alkanes are lighter than water.		2 (Any 2)	4

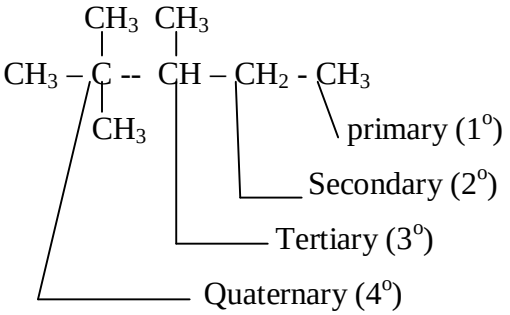
	3) Alkanes are insoluble in water but freely soluble in organic solvent. 4) Boiling point and specific gravity increases with increase in molecular weight. **Uses of Alkane:** 1) Alkanes are used in domastic fuel (natural gas) 2) Methane is used in manufacturing of carbon black. 3) Used as refrigerent and solvent. 4) Used in rubber compounding,packing tc. 5) Used in lubricant, paper, plasticizers.	2 (Any 2)	
4-d		4	4
4-e		4	4

	 m-dinitrobenzene HNO_3 Fuming  Trinitrobenzene		
4-f	**Aromatic Hydroxy compound:** 1)Depends on number of hydroxy group attached to benzene ring aromatic hydroxy compounds are classified as monohydric,dihydric and trihydric as they contain one,two and three hydroxyl group    2) Those containing the hydroxyl group in the side chain are term as aromatic	2 2	4

	alcohols.These may be regarded as aryl derivatives of the aliphatic alcohols.   benzyl alcohol phenyl ethyl alcohol		
5-a	**Theory of Hydrogen ion indicator** In titrations of acids with alkalis a colour change depends upon hydrogen ion concentration in reaction mixture for weak acid and weak bases, the unionized form & ionized form develop different colours in aqueous solution based on hydrogen ion concentration. So, in acid base titrations the indicators used are themselves weak acid or weak bases. The selection of indicator is very important. At different P_H range, colour change varies with indicator. It can be explained by following examples :- 1) **Phenolophthalein** gives full acid colour (colourless) when added to solution having P_H 8.3 or below and full basic colour (pink) in a solution having P_H 10 or above. So, P_H range over which phenolphthalein can be used is 8.3 and 10. **OR** 2) **Methyl orange** gives full acid colour (red) when added to solution having P_H 3 or below and full basic colour (yellow) in a solution of P_H 4.4 or above. So, P_H range over which methyl orange can be used is 3 to 4.4.	2 2	4
5-b	**A minimum boiling azeotrope** is a solution of some definite composition which boils at a definite temperature which is lower than boiling point of both	1	4

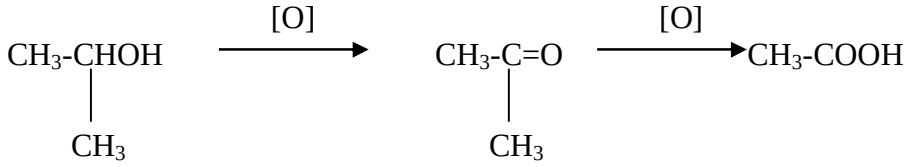
	the components of solution. Example. :- Water ethanol system boils at a temperature 78.1 ^{o}c, which is lower than boiling point of both components. Water (100 ^{o}c) , ethanol (78.3 ^{o}c). **A maximum boiling azeotrope** is solution of definite composition which boils at a temperature higher than boiling point of both the components of the solution. **Example** :- water + Hcl system, boils at a temperature 110 , which is higher than boiling point of water (100 ^{o}c) & Hcl (-85 ^{o}c)	1 1 1	
5-c	1) **Action of sodium metal on alcohol** : The hydrogen atom of the hydroxyl group (-OH) is replaced by an atom of metal with the evalution of hydrogen and alkoxide. $2C_2H_5OH + 2Na \longrightarrow 2C_2H_5ONa + H_2$ Ethanol Na – alkoxide 2) **Action of Acetic acide on alcohol** : Alcohol reacts with organic acids to form esters. The process is called as esterification. The process is generally carried out in presence of conC. H_2SO_4 CH_3CO [oH +H] $O C_2H_5 \rightleftharpoons CH_2COOC_2H_5 + H_2O$ Acetic acid Ethanol Ethyl acetate (Ester)	2 2	4
5-d	**Physical properties of phenol** :- It is colourless crystalline substance, m.pt = 43 ^{o}c b.pt = 18_2 ^{o}c ,moderately soluble in water, more in alcohol and ether. The needle shape crystals are hydroscopic, corrosive and poisonoces, turn pink on exposure to air and light . (Any 2) **Uses of phenol** :- 1) In the manufacture of drug like salol, aspirin, salicylic acid and phenacetin. 2) As an antiseptic carbolic lotion and carbolic soaps.	2 2	4

5-e	**Methods of preparation of alkenes**: (Any 2) 1) **By Dehydration of alcohols** : When alcohols methods is heated in presence of sulphuric acide , water is eliminated and alkene is formed.  - Propanol propene 2) **By dehydrogenation of alkyl halide** : When alkyl halide heated with alcoholic solution of Na or k-hydroxide, hydrogen halide is eliminated and alkene is formed.  - Bromopropane propene 3) **By dehalogenation of vicinal dihalide**. : A compound having two halogen atoms on adjacent carbon atoms is called a vicinal dehalide. Alkanes are formed when vicinal dehalids are heated with Zn-dust in ethyl alcohol.  - z Dibromopropane propene 4) **By cracking of Alkanes**: Alkanes when heated at 500 – 700 °c in absence of air, decomposes to yield lower molecular weight alkenes, alkanes and hydrogen.	2 marks each	4

	a) $CH_3 - CH_3 \xrightarrow{600\,^oc} CH_2 = CH_2 + CH_4 + H_2$ Ethane ethylene methane b) $CH_3 - CH_2 - CH_3 \xrightarrow{600\,^oc} CH_3 - CH = CH_2 + CH_2 = CH_2 + CH_4 + H_2$ Propane propane Ethylene methane		
5-f	**Classification of carbon atoms :** 1) Primary carbon : A carbon atom attached to one other carbon atom is called primary carbon (1^o carbon) 2) Secondary carbon : A carbon atom attached to two other carbon atoms is called a secondary carbon atom (2^o carbon) 3) Tertiary carbon : A carbon atom attached to three other carbon atoms is called tertiary carbon (3^o carbon) 4) Quaternary carbon A carbon atom attached to four other carbon atoms is called tertiary carbon (4^o carbon)  	1 1 1 1	4
6-a	**Pyrolysis of alkanes** : The decomposition of a compound by heat is called as pyrolysis. When alkanes are heated to high temperature in absence of air, thermal decomposition takes place. Larfge alkane molecules are broken down into smaller, lower molecular	2	4

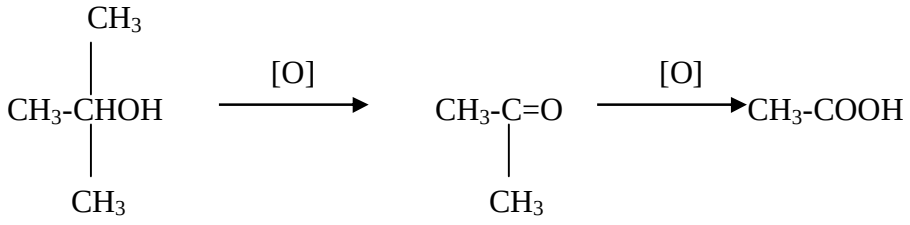
	weight alkanes, alkanes and hydrogen pyrolysis requires temperature 500 – 800°c , in presence of silica alumina catalyst ethane when heated to 500 °c methane, ethylene & hydrogen is obtained. $H_3C - CH_3 \xrightarrow[\text{Absence of air}]{500\,^{o}c} CH_2=CH_2 + CH_4 + H_2$ Ethane Ethylene methane	2	
6-b	i) **Action of metallic sodium of phenol** : Phenols react with metallic sodium to give sodium phenoxide $2C_6H_5OH + 2Na \longrightarrow 2C_6H_5ONa + H_2$ Phenol sodium phenoxide	2	4
	ii) **Action of phosphorus pentachloride on phenol** : Phenols reacts with phosphorous pentahalides, when OH group is replaced by halogen atom. $C_6H_5OH + PCl_5 \longrightarrow C_6H_5Cl + POCl_3 + HCL$ Phenol chlorobenzene	2	
6-c	**Differentiate between primary, secondary and tertiary alcohols.** To differentiate between primary, secondary and tertiary alcohols, four methods are used (any 2 methods) (1) Oxidation method (2) Action of hot reduced cu. (3) victor mayer's method (4) Lucas test. 1) **Oxidation method** :- i) primary alcohols easily oxidized to aldehydes and then to acids, containing same number of carbon atoms , as the original alcohol. $CH_3-CH_2OH \xrightarrow{[O]} CH_3-CHO \xrightarrow{[O]} CH_3-COOH$ Ethyl alcohol acetaldehyde acetic acid	2	4

ii) Secondary alcohol, gives ketone, which on prolonged oxidation, by action of oxidizing agent gives acids.



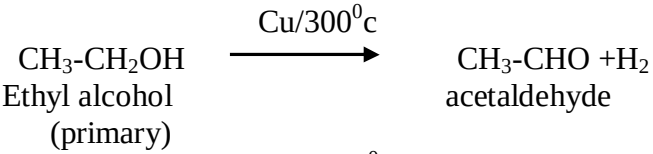
Isopropyl alcohol acetone acetic acid

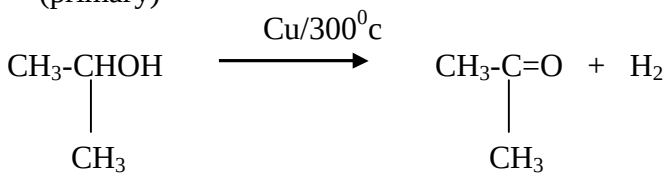
iii)Tertiary alcohol are oxidized by acid oxidizing agents to give mixture of keton and acid



Tertiary butyl alcohol acetone acetic acid

(2) By action of hot reduced Cu : with hot reduced cu at 300^{o}c , primary alcohol gives aldehydes secondary gives ketone and tertiary alcohols gives olefins.

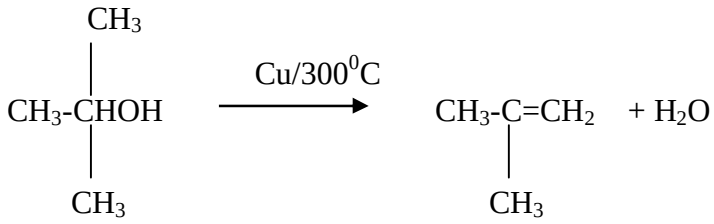
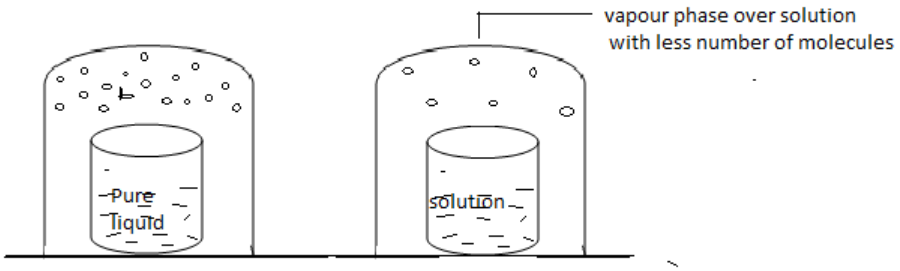




Isopropyl alcohol acetone

(secondary)

2

	 Tertiary butyl alcohol isobutylene		
6-d	In a pure liquid, the whole surface of the liquid is occupied by the molecule of the liquid. In case of solution, a part of surface of the solution is occupied by the solute particles. This decreases the number of molecules of the liquid at the surface of the solution. This reduces the escaping tendency of solvent molecule thereby lowering the vapour pressure of the liquid (solvent)  	3 1	4

<table>
<tr>
<td>6-e</td>
<td>Differences between alkanes and alkene
<table>
<tr><th>Alkanes</th><th>Alkenes</th></tr>
<tr><td>Simplest organic compound made of carbon and hydrogen only, with single bond.</td><td>They are hydrocarbons, that contains carbon. carbon double bond.</td></tr>
<tr><td>Called as saturated hydrocarbons</td><td>Called as unsaturated hydrocarbons</td></tr>
<tr><td>General molecular formula C_nH_{2n+2}</td><td>Molecular formula C_nH_{2n}</td></tr>
<tr><td>Alkanes are quite inert</td><td>Alkenes are more reactive than alkanes</td></tr>
<tr><td>Shows substitution reaction & thermal & catalytic reactions.</td><td>Shows addition reactions.</td></tr>
</table>
</td>
<td>1mark each for any 4</td>
<td>4</td>
</tr>
<tr>
<td>6-f</td>
<td>1) Isomerism : The compounds which have same molecular formula with different structural formula are said to exhibit isomerism (any one example)
Example : alkyl halides shows following two types of isomerism.
a) Chain isomerism : alkyl halides as are derivative of paraffin, shows chain isomerism depending upon nature of chain whether straight or branched.
$CH_3CH_2CH_2CH_2Br$ $CH_3\text{-}\underset{\displaystyle CH_3}{\underset{|}{CH}}\text{-}CH_2Br$
1-Bromobutane isobutyl bromide
(straight) (branched)
b) Position isomerism : Isomerism exhibited by alkyl halides due to difference in position of the halogen atom in same chain is termed as position isomerism.</td>
<td>2</td>
<td>4</td>
</tr>
</table>

	Example : $CH_3CH_2CH_2I$ 1-iodopropane CH_3CHICH_3 2-iodopropane 2) **Polymerisation :** It is the process of combination of two or more monomeric units to form a high molecular weight compound with or without the elimination of H_2O , Hcl etc. under specific conditions of temperature pressure and catalyst. Example : a) $nCH_2=CH_2$ (ethylene) $\xrightarrow{\text{polymerisation}}$ $[-CH_2-CH_2-]_n$ (polyethylene) b)) $nCH_3CH=CH_2$ (propylene) $\xrightarrow{\text{polymerisation}}$ $[-CH_3-CH-CH_2-]_n$ (polypropylene)	2	