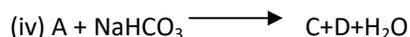
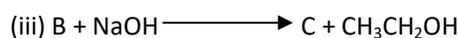
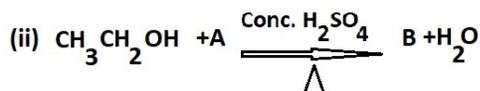
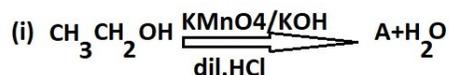


Carbon and CompoundsLong Answer Type Questions

Q1. An organic compound A on heating with concentrated  $\text{H}_2\text{SO}_4$  forms a compound B which on addition of one mole of hydrogen in presence of Ni forms a compound C. One mole of compound 'C' on combustion forms two moles of  $\text{CO}_2$  and 3 mole of  $\text{H}_2\text{O}$ . Identify the compounds A, B and C. Write the chemical equations of the reactions involved.

Q2. Write the equations for each reaction. Identify the compounds A to F in the following reaction sequence



Q3. What are soaps and detergents? Explain the mechanism of cleansing action of soaps and detergents.

Q4. Explain the given reactions with examples

- Hydrogenation reaction
- Oxidation reaction
- Substitution reaction
- Saponification reaction
- Combustion reaction

Q5. Draw the structures for the following compounds

- Ethanoic acid
- Bromopentane
- Butanone
- Hexanal

Are structural isomers possible for bromopentane?

Q6. What is a Homologous series? Describe briefly the various homologous groups of Organic compounds.

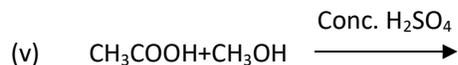
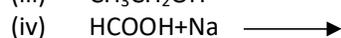
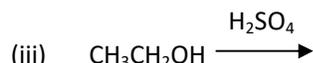
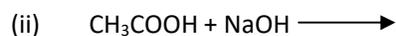
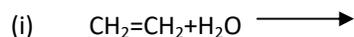
Q7. How can Ethanol and Ethanoic acid be differentiated on the basis of their physical and chemical properties?

Q8. What is isomerism? Give the structural isomers of Pentane.

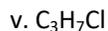
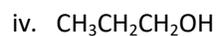
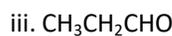
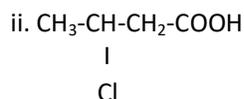
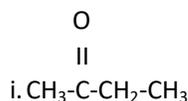
Q9. Give the structure of Diamond and explain its one property based upon structure.

Q10. Give the structure of Graphite and explain its one property based upon structure.

Q11. Complete the following chemical reactions and write the chemical name of the products obtained



Q12. Give IUPAC names of the following:-



### Very Short Answer Type Questions

Q1. What happens when a small piece of sodium is dropped into ethanol ?

Q2. Draw the structure of Benzene and cyclohexane.

Q3. Draw the electron dot structure of Ethane.

Q4. Give two points of difference between soap and detergent. Would you be able to check if water is hard by using a detergent.

Q5. Where do compounds of Carbon, find its applications?

Q6. Micelle formation will take place when soap is dissolved in Organic solvent?

Q7. What is hydrogenation? What is its industrial application?

Q8. Explain why washing clothes with hard water is not effective.

Q9. Define allotropy. Name three allotropic forms of carbon.

Q10. Give the structure of Fullerenes.

Q11. What is saponification? Give an example.

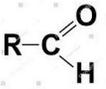
Q12. Why detergents are preferred over soap?

Q13. What is meant by hydrolysis of an ester? Explain.

Q14. What is meant by denatured alcohol? What is the need to denature alcohol ?

Q15. Explain soaps are not effective cleansing agents in hard water?

### Multiple Choice Questions

- The following saturated hydrocarbon cannot show isomerism.  
a) Methane    b) Butane    c) Pentane    d) Hexane
-  is the functional group of  
a. Ketones    b. Alcohols    c. Aldehydes    d. Carboxylic Acid
- Maximum covalency of Carbon is  
a. 2    b. 4    c. 6    d. 1
- n-Pentane and isopentane represent  
a. Structural isomers    b. Homologous    c. Same compound    d. None of the above
- $C_3H_8$  belongs to the homologous series of  
a. Alkynes    b. Alkenes    c. Alkanes    d. Cyclo alkanes
- The number of isomers of Pentane is  
a. 2    b. 3    c. 4    d. 5
- Name the functional group present in  $CH_3COCH_3$   
a. Alcohol    b. Carboxylic acid    c. Ketone    d. Aldehyde
- Addition reactions are undergone by  
a. alkanes    b. alkenes    c. alkynes    d. both alkenes and alkynes.
- Vinegar is :-  
a. 25% acetic acid    b. 6-8% acetic acid    c. Pure acetic acid    d. 50% acetic acid
- Soaps are formed by saponification of  
a. alcohols    b. glycosides    c. esters    d. carboxylic acids
- Buckminsterfullerene is an allotropic form of  
a. Phosphorous    b. Sulphur    c. Carbon    d. Tin
- How many electrons are there in the outermost shell of carbon  
a. 1    b. 2    c. 3    d. 4
- The functional group present in Ethanol is  
a.  $-OH$     b.  $-CHO$     c.  $-COOH$     d. None of these
- Any two adjacent members of a homologous series differ by  
a.  $CH_3$  unit    b.  $CH_2$  unit    c.  $CH$  unit    d.  $C_2H_4$  unit
- The property of self-linkage among identical atoms to form long chain compounds is known as:-  
a. Catenation    b. Isomerism    c. Halogenation    d. All of the above

### Assertion-A and Reasoning-B Type Questions

Two statements (Assertion-A and Reason-R) are given. Select the correct answer to these questions from codes a, b, c and d as given below

- (a) Both A and R are true, and R is the correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true but R is false.
- (d) A is false but R is true.

1. Assertion:- Carbon is a versatile element that forms the basis for all living organisms and many of the things we use.

Reason: The large variety of compounds are formed by carbon because of its tetravalency and the property of the catenation that it exhibits.

2. Assertion: Covalent bonds are formed by the sharing of electrons between two atoms so that both can achieve a completely filled outermost shell.

Reason: Carbon forms covalent bonds with itself and other elements such as hydrogen, oxygen, sulphur, nitrogen and chlorine.

3. Assertion: The heteroatoms which confer specific properties to the organic compounds, regardless of the length and nature of the carbon chain are called functional groups.

Reason: The functional groups such as alcohols, aldehydes, ketones and carboxylic acids bestow characteristic properties to the carbon compounds that contain them.

#### Q. Read the following and answer any four questions.

Ethanoic acid reacts with ethanol in presence of an acid catalyst to form ester

- (a) Write the chemical reaction.
- (b) What this reaction is called?
- (c) How this reaction can be used as a test for alcohols?
- (d) During the reaction  $H^+$  is released by acid or alcohol.
- (e) What is the role of acid catalyst in the reaction.

Q. The series of organic compounds in which same group substitutes for hydrogen in a carbon chain is called a homologous series. e.g alkanes, alkenes, alcohols, carboxylic acids

- (a) Write the general formula for homologous series of alkanes, alkenes, alkynes.
- (b) Write the functional group of alcohols, aldehydes, ketones.
- (c) Draw the structure of functional group of carboxylic acid.
- (d) What happens to the physical properties in a homologous series.
- (e) Organic compounds in a homologous series show similar chemical properties. Comment.