

# ICSE Sample Question Paper on Organic Chemistry

Full Marks: 80

Time allotted: An hour and a half

## Instructions:

1. This question paper consists of two sections.
2. Section A is compulsory.
3. Attempt **any four** questions from Section B.
4. You may have to refer to the diagram sheet at the end of the question paper for answering certain questions from Section A as well as from Section B. In such a case, **do not** copy any diagrams from the diagram sheet.
5. You need to provide appropriate chemical equations while answering all questions where it is possible to do so.

### Section A (40 marks)

**Question 1: Draw the branched structural formula of the following organic compounds: 8 marks**

- a) 2-butene (trans)
- b) 2,3-dimethylbut-1-ene
- c) 4-methylhex-2-yne
- d) Pent-2-en-1-oic acid

**Question 2: Give a difference between each of the following pairs according to the topic given in brackets: 8 marks**

- a) Organic Compounds/ Inorganic Compounds (Combustibility)
- b) Homocyclic Compounds/ Heterocyclic Compounds (Composition)
- c) Branched Structural Formula/ Electronic structural formula (Any difference)
- d) Alkanes/ Alkynes (Type of isomerism with reason)

- e) Propanal/ Butanone (Structure of functional group present)
- f) Geometrical isomerism/ Chain isomerism (Any difference)
- g) Prefix/ Root word (Indication in IUPAC names)
- h) Alkanes/ Alkenes (Reactivity)

**Question 3: Give the IUPAC names of the organic compounds whose structures have been drawn on the DIAGRAM SHEET at the end of the question paper: 8 marks**

**Question 4: Give balanced chemical equations for the following reactions: 8 marks**

- a) Laboratory preparation of acetylene
- b) Preparation of ethane through Wurtz reaction
- c) Oxidation of methane in presence of MoO as catalyst
- d) Reaction of ethene with concentrated sulphuric acid
- e) Reaction of an organic acid with zinc
- f) Preparation of methanol using water gas
- g) Reaction of ethanol with sodium
- h) Combustion of ethyne

**Question 5: Answer the following questions: 8 marks**

- a) Discuss the growth of organic chemistry in the nineteenth century.
- b) Mention the reasons why a separate branch called 'Organic Chemistry' was created.
- c) Define the term 'homologous series'. What is its significance?
- d) What do you mean by 'addition reaction'? Give a balanced chemical equation to show an example.

### Section B (40 marks)

**Question 6: 3+3+4=10 marks**

- a) With reference to the laboratory preparation of ethane, mention the following:
  - i) The reactants used
  - ii) Method of collection of the product with reason
  - iii) Definition of decarboxylation
  
- b) Discuss the chlorination of methane with the conditions required, the products obtained and appropriate chemical equations.
  
- c) Describe, with appropriate chemical equations, how ethanoic acid can be obtained by the slow oxidation of ethane.

**Question 7: 3+3+4=10 marks**

- a) Refer to the DIAGRAM SHEET at the end of the question paper. Study Fig. 'A'

carefully and answer the following:

- i) Identify A, B, C and D.
- ii) Describe the procedure of the process shown.

b) Show, with balanced chemical equations, how you would test whether:

- i) A given hydrocarbon is unsaturated.
- ii) A given unsaturated hydrocarbon is ethene.

c) Describe the reactions of ethene with the following reactants:

- i) Hydrochloric acid
- ii) Ozone

**Question 8: 3+3+4=10 marks**

a) Fill in the blanks. Do not copy the passage:

During the laboratory preparation of acetylene, ..... reacts with ..... to give ethyne which is collected by the ..... displacement of ..... . Ethyne absorbs all impurities formed except ..... which is absorbed in acidified .....

- b) i) Give a test for ethyne. Also give the related chemical equation.
- ii) Show how an alkyne can be converted into an alkane. Give the appropriate chemical equations alongwith your explanation.

c) Give balanced chemical equations for the following conversions. Also mention the catalyst used, where possible:

- i) Ethyne to 1,2-dibromoethene
- ii) Ethyne to Acetylene di iodide
- iii) 1,2-dibromoethene to Ethyne
- iv) Acetylene to Oxalic acid

**Question 9: 3+3+4=10 marks**

a) Give a chemical equation to show how ethanol can be obtained by:

- i) Hydrolysis of chloroethane
- ii) Hydrolysis of ethene
- iii) Fermentation of sugar

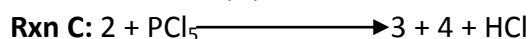
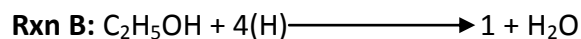
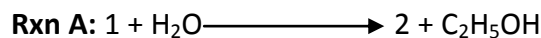
b) Describe, with appropriate chemical equations, how formic acid can be obtained from methyl alcohol.

c) Give the conditions required and the products obtained in the reactions of ethanol with:

- i) Sodium
- ii) Concentrated sulphuric acid
- iii) Nascent oxygen
- iv) It undergoes an esterification reaction.

**Question 10: 3+4+3=10 marks**

a) Given below are three chemical equations. Study them carefully and answer the questions that follow:



- i) Give the IUPAC names of compounds 1, 2, 3 and 4.
- ii) Mention the nature of compound 2 and state the cause for it.

b) Give a balanced chemical equation for the following conversions:

- i) Ethanoic acid to Zinc acetate
- ii) Phosphorus trichloride to Phosphorous acid
- iii) Calcium hydroxide to Calcium acetate
- iv) Sodium Carbonate to Sodium acetate

- c) i) Give two tests for acetic acid.
- ii) What do you mean by 'fatty acid' and 'glacial acetic acid'?

**Question 11: 5+5=10 marks**

a) Mention an organic substance used for the following purposes:

- i) Manufacture of di-ethyl ether
- ii) As an anti-freeze for automobiles
- iii) As an illuminant fuel
- iv) For preservation of fruits
- v) As a solvent for waxes
- vi) For coagulating rubber
- vii) In manufacture of formic acid
- viii) As a solvent for sulphur
- ix) For removing ink stains
- x) For the manufacture of synthetic rubber and fibres

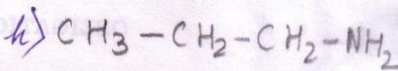
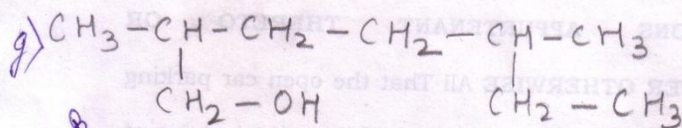
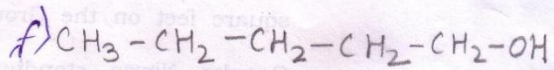
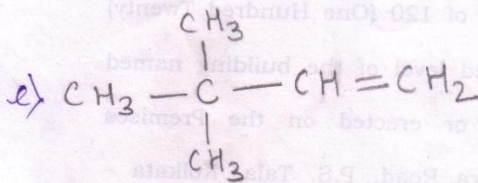
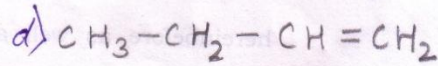
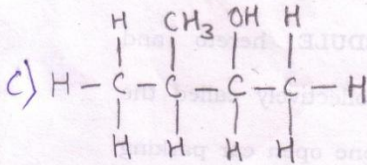
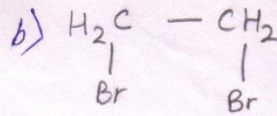
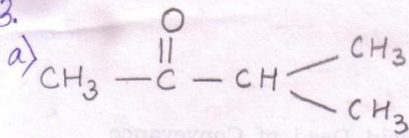
b) Answer the following questions:

- i) What is an olefinic bond?
- ii) What do you mean by 'acetylenic linkage'?
- iii) Why are alkanes also known as paraffins and unsaturated hydrocarbons?
- iv) Mention four common sources of methane.
- v) Discuss the two-step classification of alcohols.

Sec A

# DIAGRAM SHEET

Q3.



Sec B

Q4 a)

