



## CHEMISTRY

### BOOKS - BHARATI BHAWAN CHEMISTRY (HINGLISH)

### CARBON COMPOUNDS

#### Fill In The Blanks

1. Propene and propyne are \_\_\_\_ compounds



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2. A saturated hydrocarbon reacts with chlorine in the presence of \_\_\_\_



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3. Ethanol reacts with sodium to produce \_\_\_ and \_\_\_ gas

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4. Vinegar is a solutions of 5% \_\_\_\_\_ in water

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5. \_\_\_\_\_ is the first member of the homologous series of alkynes.

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6. Unsaturated hydrocarbons show \_\_\_\_\_ reactions .

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7.  $C_nH_{2n}$  is the general formula of \_\_\_\_\_

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8. The hydrocarbons with the general formula  $C_nH_{2n-2}$  are called

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9. The sodium salt of a long - chain fatty acid is called \_\_\_\_\_

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10. The functional group present in  $C_2H_5CO_2H$  is \_\_\_\_\_

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11. The IUPAC name of isobutane is \_\_\_\_\_.

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1. Is ethene a saturated compound ?

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2. Is an alkyl group represented by the general formula  $C_nH_{2n+1}$  ?

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3. Is  $CH_3 - CH_2 - \underset{\substack{| \\ CH_3}}{CH_2}$  a branched -chain hydrocarbon ?

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4. Is a mixture of ethanal and water called antifreeze ?

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5. Is it true that soaps do not work well with hard water ?

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6. Are synthetic detergents biodegradable ?

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7. Is a mixture containing 95.6% ethanol and 4.4 % water called rectified spirit ?

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8. Is a mixture of caustic soda and quicklime called sodalime ?

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## Mark The Statements True T Or False F

1. The organic compounds are usually poor conductors of electricity .

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2. The soap molecule has a hydrophobic head and a hydrophilic tail.

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3. Propene is an unsaturated hydrocarbon.

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4. Ethanol reacts with sodium to produce sodium ethanoate and hydrogen.

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5. Why detergents are better cleansing agents than soaps ? Explain.

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6. All isomers of a compound have the same properties.

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7. The addition of hydrogen to a molecule is called hydrogenation.

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8. Ethanol when warmed with ethanoic acid in the presence of conc.,

$H_2SO_4$  produces a sweet - smelling substance.

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9. All detergents produce more lather with hard water than with soft water.

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10. The oxidation of ethanol gives ethanal.

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11. Sodium ethanoate when heated with sodalime gives methane.

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MCQ

1. which of the following compounds contain (s)  $-CHO$  as the functional group ?



A. propanal

B. propanol

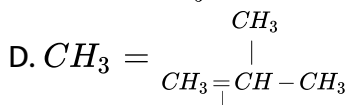
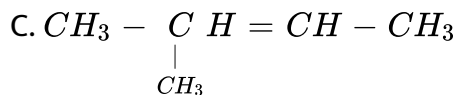
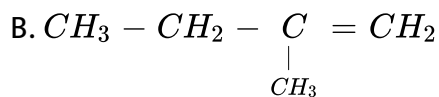
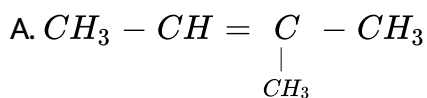
C. Propanone

D. Propanoic acid

**Answer: A**

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2. Which of the following is (are) the correct isomer(s) of pentane ?

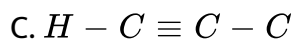


**Answer: D**



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3. Structural formula of ethyne is

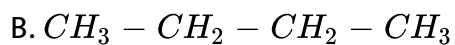
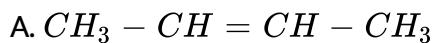


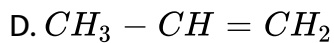
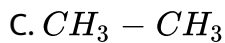
Answer: C



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4. Which of the following is (are) saturated hydrocarbon (s) ?

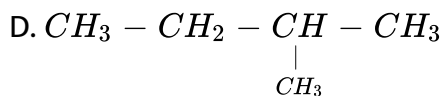
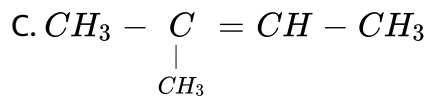
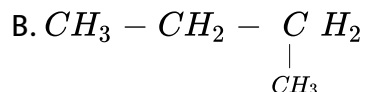
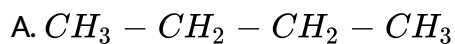




Answer: B::C

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5. Which of the following is (are) straight - chain hydrocarbon(s) ?



Answer: A::B

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6. Which of the following is the second member of the alkene homologous series ?

- A. Butyne
- B. Propene
- C. Ehtene
- D. Pentene

**Answer: B**



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7. Hydrochloric acid is a stronger acid than acetic acid. This is because

- A. hydrochloric acid does not ionize.
- B. Hydrochloric acid is completely ionized.
- C. acetic acid is only partially ionized.

D. acetic acid is not ionized.

**Answer: B::C**

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8. The number of covalent bonds in a molecule of ethylene ( $C_2H_4$ ) is

A. 4

B. 12

C. 6

D. 5

**Answer: C**

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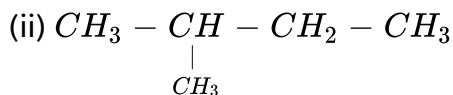
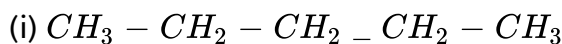
9. Which of the following statement(s) is (are) wrong ?

- A. Methane cannot undergo addition reactions .
- B. Ethanaol turns red litmus paper blue.
- C. Acetaldehyde contains a ketone group as the only functional group.
- D. All the isomers of a compound have the same properties.

**Answer: B::C::D**

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**10.** The compound  $C_5H_{12}$  can be represented by the following two structures.



These two structures are related to each other as

- A. allotropes

B. isotopes

C. isobars

D. isomers

**Answer: D**

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**11.** Soaps are prepared by the alkaline hydrolysis of

A. sulphuric acid

B. higher esters

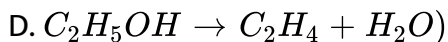
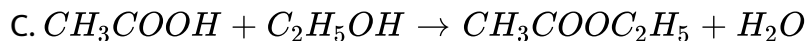
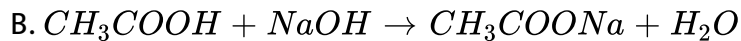
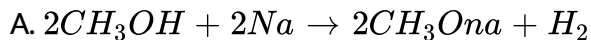
C. aldehydes

D. fatty acids

**Answer: B**

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12. Which of the following reactions is an esterification one ?



Answer: C



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### Very Short Answer Questions

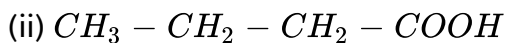
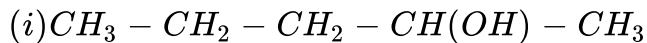
1. Draw the electron- dot structure and structural formula of ethyne.



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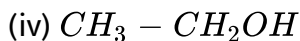
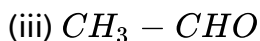
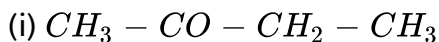


2. Give the names of the following compounds :



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3. Name the functional groups present in each of the following compounds :



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4. Which gas is evolved when a piece of a sodium is added to ethanol

? Write the equation for the reaction involved.

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5. Why do carbon compounds not conduct electricity ?

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6. What are the two properties of carbon that make it capable of forming a large number of compounds ?

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7. (a) What is meant by catenation? Name two elements which exhibit the property of catenation

(b) Write the names and structural formulae of all the possible isomers of hexane.

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8. Name the alcohol which is a constituent of wine and beer.

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9. Which acid is present in vinegar ?

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10. Write the molecular formula of the third member of the homologous series represented by the general formula  $C_nH_{2n+1}OH$

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11. Write the chemical equation for the reaction that occurs when ethyl ethanoate is allowed to react with caustic soda solution.

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12. An organic compound gives effervescence when treated with baking soda. Write the name of the compound.

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13. What are the carboxylic acids called in the IUPAC system of nomenclature?

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14. What role does methanol play when it is mixed with ethanol?

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15. Give the name of the reaction which is used in the conversion of vegetable oils into soap.

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16. What changes are observed when a soap solution is tested with a red and a blue litmus paper ?

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17. How many covalent bonds are present in a molecule with the chemical formula  $C_6H_6$  ?

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18. Can a detergent be used to produce lather when the water is hard ?

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19. Give an outline of the processes involved in the conversion of ethanoic acid into methane.



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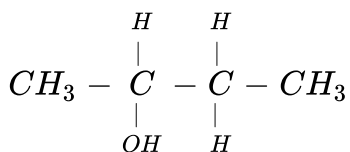
20. Why are alcohols poor conductors of electricity ?



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21. What is the functional group present in the following compound ?

Also name the compound .



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22. How would you distinguish between an alcohol and acetic acid ?



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23. What are the compounds containing the  $-COOR$  group as the functional group called ?

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### Short Answer Questions

1. Give the structural formulae of two saturated hydrocarbons.

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2. Give the structural formulae of two unsaturated hydrocarbons .

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3. What are isomers ? Write all the isomers of butane.

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4. Write the possible isomers of pentane.

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5. Arrange the following alcohols in the order of increasing number of carbon atoms and get a family. Can we call this family a homologous series ?

$C_2H_5OH$ ,  $CH_3OH$ ,  $CH_3 - CH_2 - CH_2OH$ ,  $CH_3 - (CH_2)_3 - CH_2OH$

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6. what is a functional group ? Give two examples of it .

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7. Why is soap not suitable for washing clothes when the water is hard ?

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8. Give two tests to differentiate between ethanol and ethanoic acid.

What property is common to both ?

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9. Describe the cleaning action of soap.

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10. Distinguish between saturated and unsaturated hydrocarbons. Give two examples of each.

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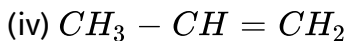
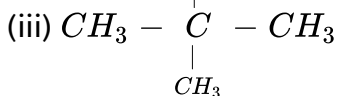
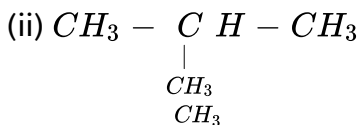
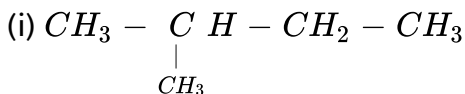
11. Draw the structures of all possible isomers of pentane.

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12. Draw two structures of molecules represented by the formula  $C_4H_{10}$

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13. Give IUPAC names of the following compounds :



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14. An organic compound of molecular formula  $C_2H_6O$  when oxidized with alkaline  $KmnO_4$  solution and then treated with dilute hydrochloric acid gives a compound A. When A is warmed with ethanol in the presence of conc.  $H_2SO_4$  it forms the compound B. B when reacted with NaOH solution gives a compound C.

(i) Give the names of A, B and C.

(ii) Give equations for the above reactions.

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15. An organic compound 'P' is a constituent of wine. 'P' on reacting with acidified  $K_2Cr_2O_7$  forms another compound 'Q'. When a piece of sodium is added to 'Q' a gas 'R' evolves which burns with a pop sound. Identify P, Q and R and write the chemical equations for the reactions involved.

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16. What is esterification ? Give an example.

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17. Write two tests to show the acidic nature of ethanoic acid.

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18. How does a double bond differ from a triple bond ?

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19. State any four uses of ethanol in our daily life.

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20. How would you distinguish between an alcohol and acetic acid ?

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21. What is a soap and how does it differ from a detergent ?

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22. Explain the following terms with suitable examples

(i) cationic detergents

(ii) anionic detergents and

(iii) non-ionic detergents.

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23. An organic compound A reacts with sodium hydroxide to form a compound B. B when heated with sodalime forms a compound B. B

when heated with sodalime forms a compound C. One mole of C burns in oxygen to produce one mole of  $CO_2$  and two moles of  $H_2O$ . Identify A, B and C.



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## Long Answer Questions

1. Carbon forms a large number of compounds because of its two unique properties formed many have long straight chains of carbon, branched chains of carbon or rings of carbon. In these compounds, carbon atoms may form single, double or triple covalent bonds. Compounds in which the carbon atoms are linked to each other by single bonds are called saturated carbon compounds whereas compounds having at least one carbon-carbon double or triple bond are called unsaturated carbon compounds. Compounds containing only carbon and hydrogen are known as hydrocarbons. Based on the above

information, answer the following questions.

i. Why does carbon form large number of compounds?

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2. State the characteristics of a homologous series.

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3. Describe and activity to show that ethanol and ethanoic acid react to form a sweet-smelling substance called ester. Write a balanced chemical equation for the reaction involved.

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4. Explain the following with examples :

(i) Tetravalency

(ii) Substitution reaction

(iii) Addition reaction

(iv) Combustion

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5. What is liquefied petroleum gas (LPG) and show is it useful to us ?

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6. What is soap ? How can you prepare it in the laboratory ?

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