

**CBSE Test Paper-03**  
**Chapter 04 Carbon and its Compound**

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1. Match the following with the correct response: **(1)**

(1) Ionic bond	(A) $NH_3$
(2) Polar covalent bond	(B) $C_{60}$
(3) Non-polar bond	(C) $N_2$
(4) Fullerene	(D) NaCl

- a. 1-D, 2-A, 3-C, 4-B
- b. 1-C, 2-B, 3-D, 4-A
- c. 1-B, 2-D, 3-A, 4-C
- d. 1-A, 2-C, 3-B, 4-D

2. Match the following with the correct response: **(1)**

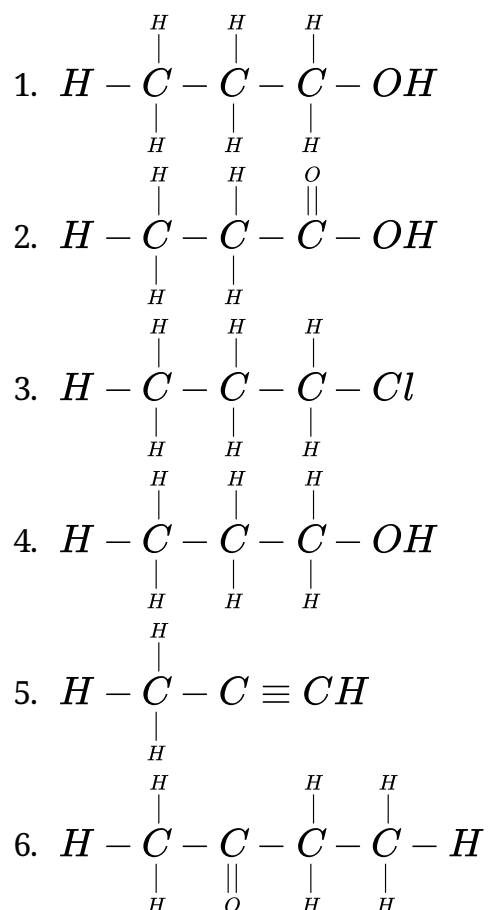
(1) Bond which holds cations and anions	(A) Ionic
(2) Self linking property of carbon	(B) Pyridine
(3) Denatured alcohol	(C) Catenation
(4) Synthetic detergents	(D) Non-biodegradable

- a. 1-D, 2-A, 3-C, 4-B
- b. 1-B, 2-D, 3-A, 4-C
- c. 1-C, 2-B, 3-D, 4-A
- d. 1-A, 2-C, 3-B, 4-D

3. Diamond is not a good conductor of electricity because: **(1)**

- a. It is not soluble in water.
- b. It is very hard.
- c. It has no free electrons to conduct electric current.
- d. Its structure is very compact.

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4. Hydrocarbon with molecular formula  $C_4H_{10}$  has: **(1)**
- 10 covalent bonds
  - 7 covalent bonds
  - 13 covalent bonds
  - 6 covalent bonds
5. Substance 'X' is formed by the reaction of carboxylic acid and alcohol. It is used in making ice creams, cold drinks, perfumes and in flavoring agent. Name 'X'. **(1)**
- Aldehyde
  - Alkyne
  - Ester
  - Ketone
6. Name the organic acid present in red ants. **(1)**
7. Would you be able to check if water is hard using a detergent? **(1)**
8. What is the common name of ethanoic acid? How ethanoic acid is different from vinegar? Give the use of vinegar in our daily life. **(1)**
9. What are constituents of an antifreeze? **(1)**
10. Explain giving chemical equation, how are esters prepared? Specify any one property and one use of esters. **(3)**
11. Write the name and chemical formula of the simplest organic acid. **(3)**
12. Why is the conversion of ethanol to ethanoic acid an oxidation reaction? **(3)**
13. Give names of the following: **(3)**
- An aldehyde derived from ethane
  - Ketone derived from butane
  - Compound obtained by the oxidation of ethanol by chromic anhydride
14. Name the following compounds. **(5)**



15. An organic compound A is widely used as a preservative in pickles and has a molecular formula  $C_2H_4O_2$ . This compound reacts with ethanol to form a sweet smelling compound B.
- i. Identify the compound A.
  - ii. Write the chemical equation for its reaction with ethanol to form compound B.
  - iii. How can we get compound A from B?
  - iv. Name the process and write corresponding chemical equation.
  - v. Which gas is produced when compound A reacts with washing soda? Write the chemical equation. **(5)**

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**Answers**

1. a. 1-D, 2-A, 3-C, 4-B

**Explanation:** NaCl has ionic bonds between the sodium ion and the chlorine ion. Ammonia has polar covalent bonds between nitrogen atom and hydrogen atoms. Nitrogen molecule has non-polar covalent bonds between the two nitrogen atoms since the two atoms are alike.  $C_{60}$  is a member of fullerenes (Allotropes of carbon). Buckminsterfullerene contains a cluster of 60 carbon atoms joined together to form spherical molecules.

2. d. 1-A, 2-C, 3-B, 4-D

**Explanation:** Ionic bonds are formed between cations and anions. Catenation is the linkage of atoms of the same element into longer chains. Catenation occurs most readily in carbon. Pyridine is added to alcohol to make it unsuitable for drinking. Most of the synthetic detergents are non-biodegradable. They cannot be decomposed by micro-organisms like the bacteria.

3. c. It has no free electrons to conduct electric current.

**Explanation: Diamond** is not a good conductor of electricity because it has no free electrons in its structure (like graphite) to conduct electric current.

4. c. 13 covalent bonds

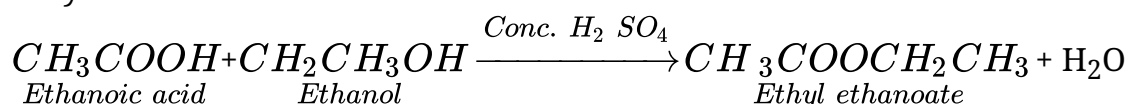
**Explanation:** Butane  $C_4H_{10}$  has 3 C-C covalent bonds and 10 C-H covalent bonds. Thus, it has 13 covalent bonds.

5. c. Ester

**Explanation:** Substance X is an ester. The reaction in which a carboxylic acid combines with an alcohol to form an ester is called esterification. Some volatile esters with characteristic odours are used in synthetic flavours, perfumes, and cosmetics. Certain volatile esters are used as solvents for lacquers, paints, and varnishes; large quantities of ethyl acetate and butyl acetate are commercially

produced for this purpose.

6. The acid produced by ants is called formic acid.
7. No, we can't check whether the water is hard or soft using a detergent.
8. Ethanoic acid ( $\text{CH}_3\text{COOH}$ ) is commonly known as acetic acid. The dilute solution of acetic acid in water (6-8%) is known as vinegar. The vinegar is used for preserving food sausage, pickles, etc.
9. Ethylene glycol or ethanol is used as an antifreeze.
10. Ethyl ethanoate which is a ester of ethanoic acid and ethanol.



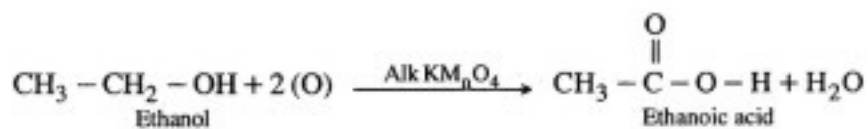
The process is called esterification.

Esters have pleasant fruity smell which is used in preparation of perfumes.

11. Formic acid is the simplest organic acid.

IUPAC name: Methanoic acid,  $\text{H} - \overset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{OH}$

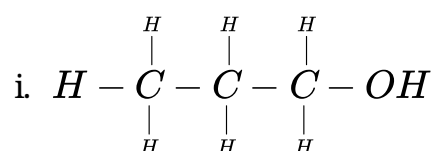
12. During the conversion of ethanol to ethanoic acid 1 oxygen atom is added to the ethanol to convert ethanoic acid. Addition of oxygen is nothing but oxidation. Hence, the conversion of ethanol to ethanoic acid called an oxidation reaction.



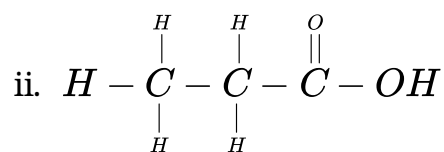
13.

(a) An aldehyde derived from ethane	(a) Ethanal ( $\text{CH}_3\text{CHO}$ )
(b) Ketone derived from butane	(b) Butanone ( $\text{CH}_3\text{COCH}_2\text{CH}_3$ )
(c) Compound obtained by the oxidation of ethanol by chromic anhydride	(c) Ethanal ( $\text{CH}_3\text{CHO}$ )

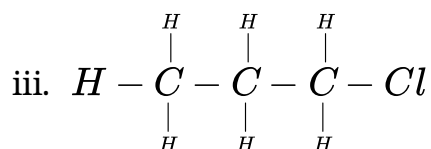
14. According to the question, Given compounds are



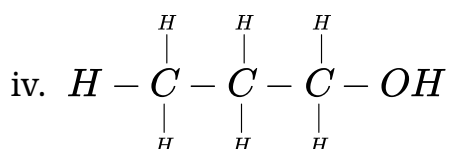
Propan-1-ol or Propanol



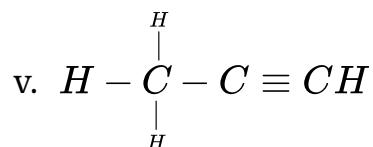
Propanoic acid



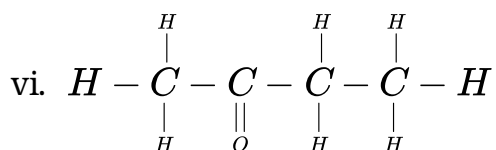
Chloropropane



Propanal

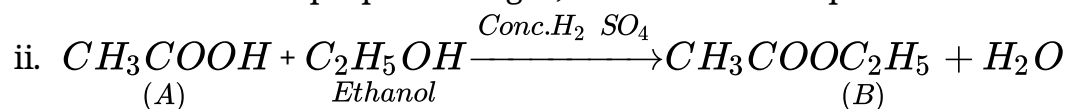


Prop-1-yne or Propyne



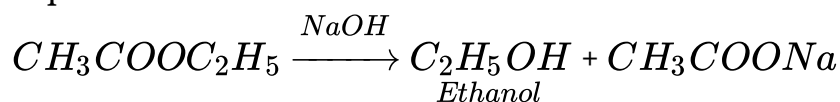
Butan-2-one

15. i. A is ethanoic acid ( $\text{CH}_3\text{COOH}$ ). Commonly, known as acetic acid. Its 5 % solution in water is used to prepare vinegar, which is used as preservatives for pickles.



- iii. Compound A (ethanoic acid) can be obtained from compound B (ethyl ethanoate) by the action of a base.

- iv. Saponification.



- v.  $\text{CO}_2$  gas is produced. This reaction is same as reaction of acid with metal carbonate.

