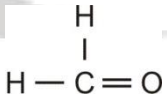
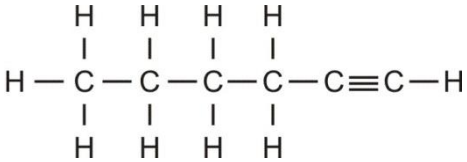
1. Why is carbon tetravalent ?
2. What is the valency of carbon in $CH_3 – CH_3$, $CH_2 = CH_2$ and $CH \equiv CH$?
3. Draw the structural formula of ethane and count the number of single covalent bonds.
4. Name an allotrope of carbon which has 60 carbon atoms.
5. Name a cyclic unsaturated hydrocarbon containing three double bonds.
6. What type of reactions are given by unsaturated hydrocarbons ?
7. What are the two properties of carbon which lead to the huge number of carbon compounds we see around us ?
8. A mixture of oxygen and ethyne is used in welding. Why do you think a mixture of ethyne and air is not used ?
9. Explain the nature of the covalent bond formation in CH_3Cl.
10. What is an homologous series ? Explain with an example.
11. Which of the following hydrocarbons undergo addition reactions ?
    C_2H_6, C_3H_8, C_3H_6, C_2H_2 and CH_4.
12. What would be the electron dot structure of carbon dioxide which has the formula, CO_2 ?
13. What would be the electron dot structure of a molecule of sulphur which is made up of eight atoms of sulpur ?
14. Draw the electron dot structure for
    (a) ethanoic acid (b) H_2S
    (c) propanone (d) F_2.
15. Write the molecular formula of pentane. How many structural isomers are possible for pentane? Draw the structures of all the possible isomers of pentane.
16. Name a molecule which contains both a single and a double bond between carbon and oxygen atom.
17. Write the name and molecular formula of alcohol derived from butane.
18. What is rectified spirit?
19. How are the molecules of aldehydes and ketones structurally different?
20. Name the organic acid present in vinegar.
21. Why is the conversion of ethanol to ethanoic acid an oxidation reaction?
22. How would you distinguish experimentally between an alcohol and a carboxylic acid?
23. What are oxidizing agents ?
24. How would you name the following compounds ?

    (i) $CH_3 – CH_2 – Br$ (ii)  (iii) 

25. Draw the structures of the following compounds :
    (i) Ethanoic acid (ii) Bromopentane (iii) Butanone (iv) Hexanal
    Are structural isomers possible for bromopentane?
26. Would you be able to check if water is hard by using a detergent ?
27. What change will you observe if you test soap with litmus paper (red or blue) ?

28. A neutral organic compound is warmed with some ethanoic acid and a little of conc. H_2SO_4. Vapours having sweet smell (fruity smell) are evolved. What type of functional group is present in this organic compound ?
29. Name the oxidizing agent which can oxidize ethanol to ethanoic acid.
30. Name the hydrophobic and hydrophilic ends of a soap.
31. An organic compound burns with a sooty flame. Is it saturated or unsaturated compound ?
32. What is scum ?
33. People use a variety of methods to wash clothes. Usually after adding the soap, they beat the clothes on a stone, or beat them with a paddle, scrub with a brush or the mixture is agitated in a washing machine. Why is this agitation necessary to get clean clothes ?
34. Why does micelle formation take place when soap is added to water ? Will a micelle be formed in other solvents like ethanol also ?
35. Give a test that can be used to differentiate between butter and cooking oil ?
36. Ethanol is oxidized to ethanoic acid. Write the equation and name of the oxidizing agent.
37. A compound with molecular formula, C_3H_8O reacts with sodium metal to evolve hydrogen gas. What are the possible structures of the compound ?
38. Explain the formation of scum when hard water is treated with soap.
39. Explain What is hydrogenation ? What is its industrial application ?
40. Two carbon compounds A and B have the molecular formula C_3H_8 and C_3H_6 respectively. Which one of the two is most likely to show addition reaction ? Justify your answer. Explain with the help of a chemical equation, how an addition reaction is useful in vegetable ghee industry.
41. An organic compound A is a constituent of antifreeze. This compound on heating with oxygen forms another organic compound B which has the molecular formula, $C_2H_4O_2$. Identify the compounds A and B. Write a chemical equation of the reaction that takes place to form the compound B.
42. An organic compound A having molecular formula $C_2H_4O_2$ reacts with sodium metal and evolves a gas B which readily catches fire. A also reacts with ethanol in the presence of concentrated sulphuric acid to form a sweet-smelling substance C used in making perfumes.
    (i) Identify the compounds A, B and C.
    (ii) Write balanced chemical equations to represent the conversion of
    (a) compound A to compound B
    (b) compound A to compound C.