ORGANIC CHEMISTRY 11

1. What is the bonding capacity of carbon? (how many covalent bonds can a carbon atom form)

   a) 1 b) 2
   c) 3 d) 4

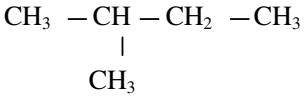
2. What is an unsaturated hydrocarbon?

   a) A hydrocarbon which contains only single carbon – carbon bonds.
   b) A hydrocarbon which contains at least one double or triple carbon – carbon bond.
   c) An alkane.
   d) A hydrocarbon which only contains one carbon atom per molecule.

3. Which ONE of the following is an alkane?

   a) C_2H_4
   b) C_3H_6
   c) C_3H_8
   d) C_2H_2

4. What is the name of the following compound?



   a) pentane
   b) methylbutane
   c) ethylpropane
   d) dimethylpropane

5. The general formula for an alkene is

   a) C_nH_n
   b) C_nH_{2n}
   c) C_nH_{2n+2}
   d) C_nH_{2n-2}

6. Which alternative in the table below shows the correct classification of the substances, CH_4, C_2H_2, C_3H_8, C_3H_6, C_5H_8 and C_5H_{10} as ALKANES, ALKENES or ALKYNES?

	ALKANES	ALKENES	ALKYNES
a)	C_3H_6, C_5H_{10}	CH_4, C_3H_8	C_2H_2, C_5H_8
b)	CH_4, C_3H_8	C_2H_2, C_5H_8	C_3H_6, C_5H_{10}
c)	CH_4, C_3H_6	C_2H_2, C_5H_{10}	C_5H_8, C_3H_8
d)	CH_4, C_3H_8	C_3H_6, C_5H_{10}	C_2H_2, C_5H_8

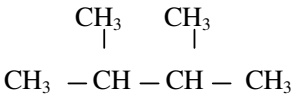
7. Organic compounds which have the same molecular formula but different structural formulas are known as

a) isotopes.
b) homologous compounds.
c) isomers.
d) polymers.

8. How many structural isomers are there with molecular formula C_5H_{12}?

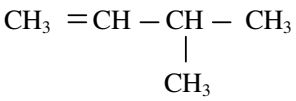
a) 2 b) 3
c) 4 d) 5

9. What is the correct name for the compound represented by the structural formula below?



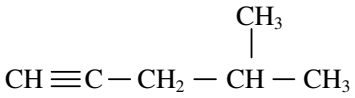
a) 2,3-dimethylbutane
b) dimethylbutane
c) 2,3,3-trimethylpropane
d) ethylbutane

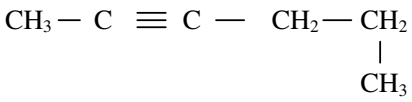
10. What is the correct name of the compound represented by the structural formula shown below?

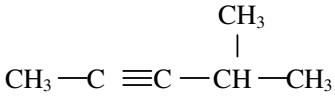


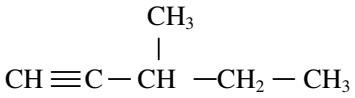
a) 2-methyl-3-butene
b) pentene
c) 3-methyl-1-butene
d) methylbutyne

11. Which one of the following shows the structural formula of 4-methyl-2-pentyne?

a) 

b) 

c) 

d) 

12. The structural formula below is for a compound known as:

Refer to page 34 of hard copy for diagram.

a) 1,2-dimethylcyclopentane
b) 4,5-dimethylcyclopentane
c) cyclohexane
d) benzene

13. The products formed from the complete combustion of hydrocarbons are

a) carbon monoxide and water.
b) carbon monoxide and hydrogen
c) carbon dioxide and water.
d) carbon dioxide and hydrogen.

14. The main component of natural gas is

a) methane
b) ethane
c) propane
d) butane

15. Which of the following shows the correct equation for the complete combustion of octane?

a) $C_8H_{18} + {}^{17}/_2O_2 \rightarrow 8CO + 9H_2O$
b) $C_8H_{18} + {}^{25}/_2O_2 \rightarrow 8CO_2 + 9H_2O$
c) $C_8H_{18} + {}^{9}/_2O_2 \rightarrow 8C + 9H_2O$
d) $C_8H_{18} + 8O_2 \rightarrow 8CO_2 + 9H_2$

16. In the presence of ultraviolet light, the following reaction will occur between methane and chlorine.

$CH_4(g) + Cl_2(g) \rightarrow CH_3Cl(g) + HCl(g)$

This type of reaction is called

a) an addition reaction.
b) a subtraction reaction.
c) a substitution reaction.
d) a hydrogenation reaction.

17. Consider the statements below describing what may happen when a sample of hexene is added to an aqueous solution containing bromine.

I. The solution becomes very hot.
II. The solution remains red due to the presence of bromine.
III. The red colour of the solution will fade due to the bromine being consumed.
IV. A pungent smelling gas is produced which turns blue litmus paper, red.

Which of the above statement/s is/are true?

a) I only.
b) III only.
c) II and IV.
d) III and IV.

18. Which equation below shows what happens in the reaction which occurs in question 17? .

a) $C_6H_{12}(l) + 2Br_2(l) \rightarrow C_6H_{10}Br_4(l) + H_2(g)$
b) $C_6H_{12}(l) + Br_2(l) \rightarrow C_6H_{12}Br_2(l)$
c) $C_6H_{12}(l) + 3Br_2(l) \rightarrow C_6H_6Br_6(l) + 3H_2(g)$
d) $C_6H_{12}(l) + 2Br_2(l) \rightarrow C_6H_{12}Br_4(l)$

19. The type of reaction which occurs between hexene and bromine is called.

a) a halogen substitution reaction.
b) an addition reaction.
c) a neutralisation reaction.
d) an oxidation – reduction reaction.

20. Which of the following substances would react *most* readily with bromine? .

a) Methane.
b) Ethane.
c) Ethene.
d) 1,2-dibromoethane.

The next two questions refer to the information below.

A student has two solutions containing organic compounds, A and B. He carries out the following tests to try to identify the solutions.

Compound A is mixed with liquid bromine in water and shaken. There is an immediate decolourisation of the red bromine solution.
When the same test is carried out on compound B, the red bromine solution decolourises very slowly and after a while, pungent acid fumes are detected.

21. Compound A could be

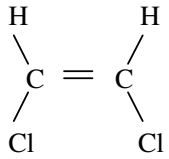
a) methane
b) ethane
c) ethene
d) 1,2-dichloroethane

22. Compound B could be .

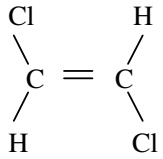
a) ethane
b) ethene
c) cis-2-butene
d) trans-2-butene

23. Study the structural formulas and statements below:

Compound 1



Compound 2



I. Compound (1) is known as cis-1,2-dichloroethene and compound (2) is known as trans-1,2-dichloroethene.
II. Both compounds are called 1,2-dichloroethene.
III. Compounds (1) and (2) are geometric isomers.
IV. Compound (1) is known as trans-1,2-dichloroethene and compound (2) is known as cis-1,2-dichloroethene.
V. These compounds will have different melting and boiling points.
VI. The two compounds would have identical physical and chemical properties.

The correct statements are

a) II, III and VI.
b) I, III and V.
c) I, III and VI.
d) III, IV and VI.