



<b>Name of the Bundle</b>	Proficient and Advanced Bundle V2	<b>Subject</b>	Competitive Exams Training (Science & Geography)
<b>Topic</b>	CARBON AND ITS COMPOUNDS	<b>Last updated on</b>	22 January 2024

1. Which element is the basis of organic chemistry?

- a. Hydrogen
- b. Carbon
- c. Oxygen
- d. Nitrogen

**Ans: b. Carbon**

2. How many valence electrons does carbon have?

- a. 2
- b. 4
- c. 6
- d. 8

**Ans: b. 4**

3. What is the general formula of alkynes?

- a.  $C_nH_{2n+2}$
- b.  $C_nH_{2n}$
- c.  $C_nH_{2n-2}$
- d.  $C_nH_{2n-4}$

**Ans: c.  $C_nH_{2n-2}$**

4. Which type of bond is present in hydrocarbons?

- a. Ionic
- b. Covalent
- c. Metallic
- d. Polar

**Ans: b. Covalent**



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5. What is the name of the simplest alkane?

- a. Methane
- b. Ethane
- c. Propane
- d. Butane

**Ans: a. Methane**

6. Which of the following is an unsaturated hydrocarbon?

- a. Methane
- b. Ethene
- c. Propane
- d. Butane

**Ans: b. Ethene**

7. What is the process of converting unsaturated fats into saturated fats by adding hydrogen called?

- a. Hydrogenation
- b. Halogenation
- c. Isomerization
- d. Polymerization

**Ans: a. Hydrogenation**

8. Which functional group is present in alcohols?

- a. -OH
- b. -COOH
- c. -CHO
- d. -NH<sub>2</sub>

**Ans: a. -OH**



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9. What is the IUPAC name for CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>3</sub>?

- a. Butane
- b. Pentane
- c. Hexane
- d. Heptane

**Ans: b. Pentane**

10. Which of the following is an aromatic hydrocarbon?

- a. Ethene
- b. Benzene
- c. Propyne
- d. Butadiene

**Ans: b. Benzene**

11. Which of the following hydrocarbons contains only single bonds between carbon atoms?

- a. Alkene
- b. Alkyne
- c. Alkane
- d. Aromatic hydrocarbon

**Ans: c. Alkane**

12. What is the general formula of alkenes?

- a. C<sub>n</sub>H<sub>2n+2</sub>
- b. C<sub>n</sub>H<sub>2n</sub>
- c. C<sub>n</sub>H<sub>2n-2</sub>
- d. C<sub>n</sub>H<sub>2n-4</sub>

**Ans: b. C<sub>n</sub>H<sub>2n</sub>**



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13. Which hydrocarbon has a triple bond between carbon atoms?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: c. Alkyne**

14. What is the name of the simplest alkene?

- a. Methane
- b. Ethene
- c. Propane
- d. Butene

**Ans: b. Ethene**

15. Which hydrocarbon contains a benzene ring?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: d. Aromatic hydrocarbon**

16. What is the general formula of alkynes?

- a.  $C_nH_{2n+2}$
- b.  $C_nH_{2n}$
- c.  $C_nH_{2n-2}$
- d.  $C_nH_{2n-4}$

**Ans: c.  $C_nH_{2n-2}$**



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17. Which of the following hydrocarbons is known for its ring structure?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Cycloalkane

**Ans: d. Cycloalkane**

18. What is the name of the hydrocarbon with the molecular formula C<sub>6</sub>H<sub>14</sub>?

- a. Hexane
- b. Cyclohexane
- c. Hexene
- d. Hexyne

**Ans: a. Hexane**

19. Which type of hydrocarbon is commonly found in natural gas?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: a. Alkane**

20. What is the name of the hydrocarbon with the molecular formula C<sub>4</sub>H<sub>8</sub> and a double bond?

- a. Butane
- b. Butene
- c. Butyne
- d. Butadiene

**Ans: b. Butene**



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21. Which hydrocarbon is commonly used as fuel in automobiles?

- a. Methane
- b. Ethene
- c. Propane
- d. Octane

**Ans: d. Octane**

22. What is the primary use of methane in households?

- a. Cooking
- b. Heating
- c. Lighting
- d. Refrigeration

**Ans: a. Cooking**

23. Which hydrocarbon is a major component of natural gas used for heating and cooking?

- a. Methane
- b. Ethane
- c. Butane
- d. Pentane

**Ans: a. Methane**

24. What is the primary use of ethene in industry?

- a. Fuel
- b. Plastic production
- c. Solvent
- d. Lubricant

**Ans: b. Plastic production**



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25. Which hydrocarbon is commonly used as a refrigerant in household appliances?

- a. Methane
- b. Ethene
- c. Propane
- d. Freon (chlorofluorocarbon)

**Ans: d. Freon (chlorofluorocarbon)**

26. What is the primary application of propane in households?

- a. Cooking
- b. Heating
- c. Lighting
- d. Power generation

**Ans: a. Cooking**

27. Which hydrocarbon is used as a raw material in the production of synthetic rubber?

- a. Ethene
- b. Propene
- c. Butene
- d. Styrene

**Ans: d. Styrene**

28. What is the primary use of butane in portable devices?

- a. Cooking
- b. Heating
- c. Lighting
- d. Fuel for lighters

**Ans: d. Fuel for lighters**



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29. Which hydrocarbon is a key component of gasoline used as fuel for cars?

- a. Methane
- b. Ethene
- c. Propane
- d. Octane

**Ans: d. Octane**

30. What is the primary use of benzene in industry?

- a. Fuel
- b. Solvent
- c. Lubricant
- d. Plastic production

**Ans: b. Solvent**

31. What type of bond is formed between carbon atoms in hydrocarbons?

- a. Ionic bond
- b. Metallic bond
- c. Covalent bond
- d. Hydrogen bond

**Ans: c. Covalent bond**

32. What is the geometry around each carbon atom in an alkane?

- a. Linear
- b. Trigonal planar
- c. Tetrahedral
- d. Octahedral

**Ans: c. Tetrahedral**





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33. How many sigma bonds are present in a carbon-carbon triple bond?

- a. 1
- b. 2
- c. 3
- d. 4

**Ans: c. 3**

34. Which type of bond is present in a benzene ring?

- a. Single bond
- b. Double bond
- c. Triple bond
- d. Resonant bond

**Ans: d. Resonant bond**

35. What is the bond angle around each carbon atom in an alkene?

- a. 90 degrees
- b. 109.5 degrees
- c. 120 degrees
- d. 180 degrees

**Ans: c. 120 degrees**

36. In an alkene, what is the hybridization of the carbon atoms involved in the double bond?

- a. sp<sup>1</sup>
- b. sp<sup>2</sup>
- c. sp<sup>3</sup>
- d. sp<sup>3</sup>d

**Ans: b. sp<sup>2</sup>**



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37. Which type of hydrocarbon exhibits a planar structure due to the presence of a ring of carbon atoms?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Cycloalkane

**Ans: d. Cycloalkane**

38. What is the shape of the carbon-carbon double bond in an alkene?

- a. Linear
- b. Trigonal planar
- c. Tetrahedral
- d. Trigonal pyramidal

**Ans: b. Trigonal planar**

39. What happens when a hydrocarbon undergoes combustion in the presence of sufficient oxygen?

- a. Formation of water and carbon dioxide
- b. Formation of water and carbon monoxide
- c. Formation of water and methane
- d. Formation of carbon dioxide and nitrogen

**Ans: a. Formation of water and carbon dioxide**

40. Which of the following is a common reaction of alkanes?

- a. Addition reaction
- b. Substitution reaction
- c. Polymerization reaction
- d. Esterification reaction

**Ans: b. Substitution reaction**



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41. What type of reaction converts an alkane to an alkene?

- a. Hydrogenation
- b. Dehydrogenation
- c. Halogenation
- d. Isomerization

**Ans: b. Dehydrogenation**

42. What is the product of the reaction between an alkene and bromine water?

- a. No reaction
- b. Bromoalkane
- c. Bromide ion
- d. Bromoalcohol

**Ans: b. Bromoalkane**

43. Which hydrocarbon can undergo addition reactions with hydrogen in the presence of a catalyst to form saturated hydrocarbons?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: b. Alkene**

44. What type of reaction is involved when an alkene is converted to an alcohol in the presence of water and an acid catalyst?

- a. Addition reaction
- b. Substitution reaction
- c. Elimination reaction
- d. Oxidation reaction

**Ans: a. Addition reaction**



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45. Which hydrocarbon is known for its resistance to chemical reactions, often called "inert"?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: a. Alkane**

46. In the process of cracking, hydrocarbons are broken down into smaller molecules. What is one of the main products of cracking?

- a. Methane
- b. Ethene
- c. Butane
- d. Propane

**Ans: b. Ethene**

47. Which type of hydrocarbon is commonly used in the production of synthetic polymers?

- a. Alkane
- b. Alkene
- c. Alkyne
- d. Aromatic hydrocarbon

**Ans: b. Alkene**

48. What is the reaction called when an alkene reacts with oxygen in the air to produce carbon dioxide and water, accompanied by light and heat?

- a. Combustion
- b. Hydrogenation
- c. Halogenation
- d. Polymerization

**Ans: a. Combustion**

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49. What is the general formula for saturated hydrocarbons (alkanes)?

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

**Ans: b.  $C_nH_{2n+2}$**

50. How many carbon atoms are there in the molecule with the molecular formula  $C_6H_{14}$ ?

- a. 4
- b. 6
- c. 8
- d. 10

**Ans: b. 6**

51. What is the IUPAC name for the saturated hydrocarbon with the molecular formula  $C_4H_{10}$ ?

- a. Methane
- b. Ethane
- c. Propane
- d. Butane

**Ans: d. Butane**

52. How many hydrogen atoms are there in a saturated hydrocarbon containing 8 carbon atoms?

- a. 16
- b. 18
- c. 20
- d. 22

**Ans: b. 18**



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53. What is the structural formula of propane?

- a. CH<sub>4</sub>
- b. CH<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub>
- c. CH<sub>2</sub>=CH<sub>2</sub>
- d. CH<sub>3</sub>CH<sub>3</sub>

**Ans: b. CH<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub>**

54. Which of the following is a condensed structural formula for butane?

- a. CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>3</sub>
- b. CH<sub>3</sub>-CH(CH<sub>3</sub>)-CH<sub>3</sub>
- c. CH<sub>3</sub>-CH<sub>2</sub>-CH(CH<sub>3</sub>)-CH<sub>3</sub>
- d. CH<sub>2</sub>=CH-CH<sub>2</sub>-CH<sub>3</sub>

**Ans: a. CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>3</sub>**

55. How many hydrogen atoms are present in a saturated hydrocarbon with the molecular formula C<sub>8</sub>H<sub>18</sub>?

- a. 16
- b. 18
- c. 20
- d. 22

**Ans: b. 18**

56. What is the systematic name for the saturated hydrocarbon with the molecular formula C<sub>5</sub>H<sub>12</sub>?

- a. Pentane
- b. Hexane
- c. Heptane
- d. Octane

**Ans: a. Pentane**



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57. Which of the following represents a line-angle formula for the saturated hydrocarbon with the molecular formula  $C_6H_{14}$ ?

- a.  $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$
- b.  $CH_3-CH_2-CH(CH_3)-CH_2-CH_3$
- c.  $CH_3(CH_2)_4CH_3$
- d.  $CH_3-CH(CH_3)-CH_2-CH_3$

**Ans: a.  $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$**

58. What is the molecular formula for octane, a common component of gasoline?

- a.  $C_8H_{16}$
- b.  $C_8H_{18}$
- c.  $C_8H_{20}$
- d.  $C_8H_{22}$

**Ans: b.  $C_8H_{18}$**

59. Which functional group is present in the compound  $CH_3COOH$ ?

- a. Alkene
- b. Alkyne
- c. Carboxylic acid
- d. Alcohol

**Ans: c. Carboxylic acid**

60. What is the IUPAC name for the compound  $CH_3CH_2OH$ ?

- a. Ethanol
- b. Methanol
- c. Propanol
- d. Butanol

**Ans: a. Ethanol**



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61. Which functional group is present in the compound  $\text{CH}_3\text{CHO}$ ?

- a. Ketone
- b. Aldehyde
- c. Ester
- d. Amine

**Ans: b. Aldehyde**

62. What is the IUPAC name for the compound  $\text{CH}_3\text{CH}_2\text{COCH}_3$ ?

- a. Propanone
- b. Butanone
- c. Ethanal
- d. Butanal

**Ans: b. Butanone**

63. Which functional group is present in the compound  $\text{CH}_3\text{CH}_2\text{COOH}$ ?

- a. Ester
- b. Carboxylic acid
- c. Ketone
- d. Amine

**Ans: b. Carboxylic acid**

64. What is the IUPAC name for the compound  $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ ?

- a. Methylamine
- b. Ethylamine
- c. Propylamine
- d. Butylamine

**Ans: c. Propylamine**





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65. Which functional group is present in the compound  $\text{CH}_3\text{OCH}_3$ ?

- a. Ether
- b. Ester
- c. Alkene
- d. Alcohol

**Ans: a. Ether**

66. What is the IUPAC name for the compound  $\text{CH}_3\text{COOCH}_3$ ?

- a. Methyl acetate
- b. Ethyl acetate
- c. Dimethyl ether
- d. Diethyl ether

**Ans: a. Methyl acetate**

67. Which functional group is present in the compound  $\text{CH}_3\text{CH}_2\text{CONH}_2$ ?

- a. Amine
- b. Amide
- c. Alkene
- d. Alkyne

**Ans: b. Amide**

68. What is the IUPAC name for the compound  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ ?

- a. Butanol
- b. Propanol
- c. Pentanol
- d. Butanal

**Ans: a. Butanol**



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69. Which allotrope of carbon has a three-dimensional network structure and is known for its hardness and high melting point?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: b. Diamond**

70. Which allotrope of carbon has a hexagonal arrangement of carbon atoms forming flat, layered structures?

- a. Graphene
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphene**

71. What is the third known allotrope of carbon, consisting of molecules with hollow spherical or ellipsoidal shapes?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: c. Fullerene**

72. Which allotrope of carbon is a good conductor of electricity due to its delocalized pi electrons?

- a. Graphene
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphene**



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73. What is the most stable form of carbon under standard conditions (at room temperature and pressure)?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphite**

74. Which allotrope of carbon consists of  $sp^2$  hybridized carbon atoms arranged in hexagonal rings?

- a. Graphene
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphene**

75. What is the name of the disorderly arrangement of carbon atoms in various forms, lacking a well-defined structure?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: d. Amorphous carbon**

76. Which allotrope of carbon is used as a lubricant and is a good conductor of electricity along the planes?

- a. Graphene
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphene**



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77. In which allotrope of carbon do the carbon atoms form  $sp^3$  hybridization with a tetrahedral structure?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: b. Diamond**

78. Which allotrope of carbon is commonly used in pencil "leads" due to its slippery and slippery nature?

- a. Graphite
- b. Diamond
- c. Fullerene
- d. Amorphous carbon

**Ans: a. Graphite**