Organic Chemistry: Chapter Introduction

Paracetamol, plastic, cotton and DNA share one element: carbon. Why carbon forms millions of compounds, and what this chapter teaches.

Name: Date: Score: ____ / 19

A. Fill in the blanks

1. Organic chemistry is the chemistry of ____ compounds.

2. A carbon atom forms ____ covalent bonds.

3. Carbon bonding to carbon to form chains is called ____.

4. The shape of methane is ____.

5. Cotton is mainly the carbon compound ____.

B. True or False

6. DNA is a carbon compound. True / False

7. Carbon atoms can form rings. True / False

8. Carbon usually forms 2 bonds. True / False

9. There are only a few thousand carbon compounds. True / False

C. Assertion and reason

10. Assertion (A): Carbon forms millions of compounds.
Reason (R): Carbon is tetravalent and shows catenation.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

11. Assertion (A): Organic chemistry is a separate branch of chemistry.
Reason (R): Carbon compounds are extremely numerous.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

12. Which is NOT a carbon compound?

(a) paracetamol
(b) polythene
(c) sodium chloride
(d) DNA

Answer: _____

13. The molecular formula of methane is:

(a) CH_2 (b) CH_4

(c) C_2H_6 (d) CO_2

Answer: _____

14. Catenation means:

(a) bonding to oxygen (b) self-linking of carbon atoms

(c) loss of electrons (d) dissolving

Answer: _____

15. The bond angle in methane is about:

(a) 90° (b) 109.5°

(c) 120° (d) 180°

Answer: _____

E. Numerical problems

16. How many C–H bonds are in propane, C_3H_8?

17. How many C–C bonds are in a straight chain of 6 carbons?

F. Short answer questions

18. Give two reasons why carbon forms so many compounds.

G. Match the columns

19. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. paracetamol	(a) plastic	1 → ____
2. polythene	(b) biomolecule	2 → ____
3. cellulose	(c) cotton	3 → ____
4. DNA	(d) medicine	4 → ____

Detailed solutions

1. carbon

2. 4

3. catenation

4. tetrahedral

5. cellulose

6. True. It is a biomolecule built on carbon skeletons.

7. True. Catenation gives chains and rings.

8. False. Carbon is tetravalent: 4 bonds.

9. False. There are millions.

10. (a) R explains A.

11. (a) R explains A.

12. (c) sodium chloride. NaCl contains no carbon.

13. (b) CH_4. One carbon with 4 hydrogens.

14. (b) self-linking of carbon atoms. C–C bonds form chains and rings.

15. (b) 109.5°. Tetrahedral angle.

16. Each H forms one bond with carbon. **Answer: 8**

17. n carbons in a chain have n − 1 C–C bonds. **Answer: 5**

18. Tetravalency: 4 bonds per atom. Catenation: strong C–C bonds give chains and rings.

19. 1 → (d), 2 → (a), 3 → (c), 4 → (b). Each carbon compound matches its everyday class.