

Organic Chemistry: Some Basic Principles and Techniques — CBSE Pattern Test 2

Class 11 Chemistry · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 2 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Chemistry · Organic Chemistry: Some Basic Principles and Techniques · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.

(2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.

(3) For MCQ questions choose the single correct option; for VSA answers write a single line.

(4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

1. Tetravalency of carbon means carbon has a valency of
 - (A) 4
 - (B) 2
 - (C) 3
 - (D) 1
2. The longest continuous carbon chain in a molecule is called the
 - (A) parent chain
 - (B) branch
 - (C) functional group
 - (D) substituent
3. The functional group —CHO is called
 - (A) aldehyde
 - (B) ketone
 - (C) alcohol
 - (D) acid
4. Compounds having the same molecular formula but different spatial arrangement are called
 - (A) stereoisomers
 - (B) chain isomers
 - (C) position isomers
 - (D) functional isomers
5. The bond angle in a molecule with sp^2 hybridisation is about
 - (A) 120°
 - (B) 109.5°
 - (C) 180°
 - (D) 90°
6. Resonance (mesomeric) effect involves the
 - (A) delocalisation of pi electrons
 - (B) transfer of sigma electrons
 - (C) transfer of protons
 - (D) breaking of sigma bonds
7. A free radical is a species with

- (A) an unpaired electron
 - (B) a positive charge
 - (C) a negative charge
 - (D) a lone pair
8. Addition reactions are characteristic of
- (A) unsaturated compounds
 - (B) saturated compounds
 - (C) aromatic compounds only
 - (D) ionic compounds
9. What is the parent chain?
10. What is hyperconjugation?

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. Write the IUPAC name of $\text{CH}_3\text{CH}_2\text{OH}$.
12. How many structural isomers does butane have?
13. What is the hybridisation of carbon in ethene?
14. Define a substitution reaction.

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Explain tetravalency and catenation of carbon with examples and state why organic compounds are covalent.
16. Define a functional group and describe the functional groups containing oxygen, nitrogen and halogens with examples.
17. Explain isomerism in organic compounds, distinguishing between structural and stereoisomerism with examples.
18. Explain the inductive, resonance and hyperconjugation effects with examples.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. Write the IUPAC rules for naming organic compounds. Assign the IUPAC names of $(\text{CH}_3)_3\text{C}-\text{CH}_2-\text{CH}_3$, $\text{CH}_3\text{CH}_2\text{CHO}$ and CH_3COCH_3 , explaining the steps followed.
20. Explain the formation and stability of carbocations, carbanions and free radicals, and classify organic reactions into substitution, addition and elimination with examples.

Answer Key (Marking Scheme)

- Q1 — (A) 4. Q2 — (A) parent chain. Q3 — (A) aldehyde. Q4 — (A) stereoisomers.
- Q5 — (A) 120° . Q6 — (A) delocalisation of pi electrons. Q7 — (A) an unpaired electron. Q8 — (A) unsaturated compounds.
- Q9 — The longest continuous carbon chain in the molecule.
- Q10 — The interaction of sigma C–H electrons with an empty p orbital or pi system.
- Q11 — Ethanol.
- Q12 — 2.
- Q13 — sp^2 .
- Q14 — A reaction in which an atom or group is replaced by another.

Q15 — Tetravalency and catenation as in notes; organic compounds are covalent.

Q16 — Functional groups with examples as in notes.

Q17 — Structural and stereoisomerism with examples.

Q18 — Effects as in notes.

Q19 — 2,2-dimethylbutane; propanal; propanone.

Q20 — Intermediates and reaction types as in notes.