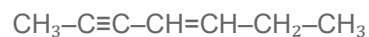


Choose the correct IUPAC name. Q1 $\text{CH}_3\text{--CH(Br)--CH(CH}_3\text{)--CH}_2\text{--CH}_3$ A. 2-bromo-3-methylpentane B. 3-methyl-2-bromopentane C. 4-bromo-3-methylpentane D. 2-methyl-3-bromopentane Q2 $\text{CH}_3\text{--C(CH}_3\text{)}_2\text{--CH}_2\text{--CH(Cl)--CH}_3$ A. 4-chloro-2,2-dimethylpentane B. 2,2-dimethyl-4-chloropentane C. 2-chloro-4,4-dimethylpentane D. 4-chloro-3,3-dimethylpentane Q3 $\text{CH}_2\text{=CH--CH(CH}_3\text{)--CH}_3$ A. 3-methylbut-1-ene B. 2-methylbut-1-ene C. 3-methylbut-2-ene D. 2-methylbut-2-ene Q4 $\text{CH}_3\text{--CH=CH--C}\equiv\text{C--CH}_3$ A. hex-4-en-2-yne B. hex-2-en-4-yne C. hex-2-yne-4-ene D. hex-4-yne-2-ene Q5 $\text{CH}_2\text{=CH--C}\equiv\text{C--CH(CH}_3\text{)--CH}_3$ A. 5-methylhex-1-en-3-yne B. 2-methylhex-5-en-3-yne C. 5-methylhex-3-en-1-yne D. 2-methylhex-1-en-3-yne Q6 Substituents: bromo + dimethyl Correct order? A. dimethyl before bromo B. bromo before dimethyl C. depends on numbering D. alphabetical doesn't apply Q7	Choose the correct structure for the name. Q1 3-methylpent-1-ene A. $\text{CH}_3\text{--CH=CH--CH(CH}_3\text{)--CH}_3$ B. $\text{CH}_2\text{=CH--CH(CH}_3\text{)--CH}_2\text{--CH}_3$ C. $\text{CH}_2\text{=CH--CH}_2\text{--CH(CH}_3\text{)--CH}_3$ D. $\text{CH}_3\text{--CH}_2\text{--CH(CH}_3\text{)--CH=CH}_2$ Q2 4-bromo-2-methylpentane A. $\text{CH}_3\text{--CH}_2\text{--CH(CH}_3\text{)--CH(Br)--CH}_3$ B. $\text{CH}_3\text{--CH(CH}_3\text{)--CH(Br)--CH}_2\text{--CH}_3$ C. $\text{CH}_3\text{--CH(CH}_3\text{)--CH}_2\text{--CH(Br)--CH}_3$ D. $\text{CH}_3\text{--CH}_2\text{--CH(Br)--CH(CH}_3\text{)--CH}_3$ Q3 hex-2-en-4-yne A. $\text{CH}_3\text{--C}\equiv\text{C--CH=CH--CH}_3$ B. $\text{CH}_3\text{--CH=CH--C}\equiv\text{C--CH}_3$ C. $\text{CH}_2\text{=CH--C}\equiv\text{C--CH}_2\text{--CH}_3$ D. $\text{CH}_3\text{--CH=CH--CH}_2\text{--C}\equiv\text{CH}$ Q4 5-methylhex-1-en-3-yne A. $\text{CH}_3\text{--CH(CH}_3\text{)--C}\equiv\text{C--CH=CH}_2$ B. $\text{CH}_2\text{=CH--CH}_2\text{--C}\equiv\text{C--CH(CH}_3\text{)}$ C. $\text{CH}_2\text{=CH--C}\equiv\text{C--CH(CH}_3\text{)--CH}_3$ D. $\text{CH}_3\text{--C}\equiv\text{C--CH=CH--CH(CH}_3\text{)}$ Q5 2,2-dimethylbutane A. $\text{CH}_3\text{--CH(CH}_3\text{)--CH(CH}_3\text{)--CH}_3$ B. $\text{CH}_3\text{--C(CH}_3\text{)}_2\text{--CH}_2\text{--CH}_3$ C. $\text{CH}_3\text{--CH}_2\text{--C(CH}_3\text{)}_2\text{--CH}_3$ D. $\text{CH}_3\text{--C(CH}_3\text{)}_2\text{--CH(CH}_3\text{)--CH}_3$ Q6 3-chlorobut-1-ene A. $\text{CH}_3\text{--CH=CH--CH}_2\text{Cl}$ B. $\text{CH}_2\text{=CH--CH}_2\text{--CH}_2\text{Cl}$ C. $\text{CH}_3\text{--CH(Cl)--CH=CH}_2$ D. $\text{CH}_2\text{=CH--CH(Cl)--CH}_3$ Q7	Q9 A compound has molecular formula C_6H_{10} and contains: - one double bond - one triple bond (a) Draw TWO different structures that satisfy this. (b) Name both using correct IUPAC rules. (c) Identify which would be numbered to give the double bond priority and explain why. Q10 A compound is named: 4-chloro-2,2-dimethylpent-3-ene (a) Draw the structure. (b) Explain why the chain is numbered from that direction. (c) State the rule used to order "chloro" and "dimethyl". Q11 Consider the structure: $\text{CH}_3\text{--CH=CH--C}\equiv\text{C--CH(CH}_3\text{)--CH}_3$ (a) Identify the correct parent chain. (b) Number the chain and justify your choice. (c) Give the full IUPAC name. (d) Explain why an alternative numbering is incorrect. Q12 Two students name the same compound: $\text{CH}_3\text{--C}\equiv\text{C--CH=CH--CH}_3$ - Student A: hex-4-en-2-yne - Student B: hex-2-en-4-yne (a) Identify the correct name. (b) Explain the mistake made by the incorrect student. (c) State the rule that resolves this ambiguity. Q13 A compound has: 7 carbons in the longest chain - but only 6 carbons in a chain containing both multiple bonds (a) Which chain should be chosen and why? (b) Give a general rule for selecting the parent chain.
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Which parent chain is correct?

- A. Longest carbon chain always
 - B. Chain with most substituents
 - C. Chain with most multiple bonds
 - D. Chain with most halogens
-

Q8



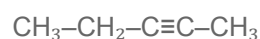
- A. hept-2-yne-4-ene
 - B. hept-4-en-2-yne
 - C. hept-2-en-4-yne
 - D. hept-4-yne-2-ene
-

Q9



- A. 2-bromo-4-chloropentane
 - B. 4-bromo-2-chloropentane
 - C. 2-chloro-4-bromopentane
 - D. 4-chloro-2-bromopentane
-

Q10



- A. pent-3-yne
- B. pent-2-yne
- C. pent-1-yne
- D. pent-yne

4-methylpent-2-yne

- A. $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{C}\equiv\text{C}-\text{CH}_3$
 - B. $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}(\text{CH}_3)-\text{CH}_3$
 - C. $\text{CH}_3-\text{CH}_2-\text{C}\equiv\text{C}-\text{CH}(\text{CH}_3)$
 - D. $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_2-\text{CH}(\text{CH}_3)$
-

Q8

2-bromo-3-chloropentane

- A. $\text{CH}_3-\text{CH}_2-\text{CH}(\text{Br})-\text{CH}(\text{Cl})-\text{CH}_3$
- B. $\text{CH}_3-\text{CH}(\text{Cl})-\text{CH}(\text{Br})-\text{CH}_2-\text{CH}_3$
- C. $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}(\text{Cl})-\text{CH}_2-\text{CH}_3$
- D. $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}_2-\text{CH}(\text{Cl})-\text{CH}_3$

Q14 (synthesis of rules)

Draw a structure that matches:

3-bromo-5-methylhex-1-en-4-yne

Then:

- (a) Verify your numbering
- (b) Circle the parent chain
- (c) Explain how you ensured correct substituent ordering

1. A 2. A 3. A 4. B 5. A 6. B 7. C 8. B 9. D 10. B	Q1: 3-methylpent-1-ene Answer: B • Double bond must be at C1 → starts $\text{CH}_2=\text{CH}-$ • Methyl at C3 ✓ Matches: $\text{CH}_2=\text{CH}-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{CH}_3$ Q2: 4-bromo-2-methylpentane Answer: C • Methyl at C2 • Bromo at C4 • Correct numbering direction used Q3: hex-2-en-4-yne Answer: B • Double bond at C2 • Triple bond at C4 • Correct order: -en before -yne Q4: 5-methylhex-1-en-3-yne Answer: C • Double at 1 → $\text{CH}_2=$ • Triple at 3 • Methyl at 5 Q5: 2,2-dimethylbutane Answer: B • Two methyl groups on C2 Q6: 3-chlorobut-1-ene Answer: D • Double bond at C1 • Cl at C3 Q7: 4-methylpent-2-yne Answer: B • Triple bond at C2 • Methyl at C4 Q8: 2-bromo-3-chloropentane Answer: C • Br at C2, Cl at C3 • Alphabetical order doesn't affect positions, only naming	9 TWO valid structures Any correct answer must: • have 6 carbons • contain 1 C=C and 1 C≡C • satisfy valency Structure 1 $\text{CH}_2=\text{CH}-\text{CH}_2-\text{C}\equiv\text{C}-\text{CH}_3$ Structure 2 $\text{CH}_3-\text{CH}=\text{CH}-\text{C}\equiv\text{C}-\text{CH}_3$ 10 Correct IUPAC names Structure 1 $\text{CH}_2=\text{CH}-\text{CH}_2-\text{C}\equiv\text{C}-\text{CH}_3$ Number from double bond end: hex-1-en-4-yne 11 Structure 2 $\text{CH}_3-\text{CH}=\text{CH}-\text{C}\equiv\text{C}-\text{CH}_3$ Numbering gives lowest set from FPOD: hex-2-en-4-yne 12 Which numbering gives double bond priority + why Correct answer: hex-2-en-4-yne The structure is numbered so that the double bond gets the lowest possible number when there is a tie between multiple bond directions. 13 Explanation (exam wording) When numbering enynes: • First minimise the set of locants for multiple bonds • If there is a tie, the double bond (-ene) gets priority over the triple bond (-yne) This is because: • Double bonds are considered higher priority in IUPAC nomenclature than triple bonds for numbering purposes. 14 Applied to this question: • Both directions give {1,4} or {2,4} • So choose direction giving double bond the lowest number
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