IUPAC Naming: Root, Suffix and Prefix

How a chemical name is built from a molecule: the root counts the parent chain's carbons, the suffix gives its bonds and principal group, and the prefix names what is attached.

Name: _____ Date: _____ Score: ____ / 19

A. Fill in the blanks

1. The root word for a parent chain of three carbons is ____.

2. The primary suffix for a chain with only C–C single bonds is ____.

3. The secondary suffix for an alcohol is ____.

4. A CH_3– group attached to the parent chain is named ____.

5. The IUPAC name of CH_3CH_2CHO is ____.

B. True or False

6. The root word depends on the number of carbons in the parent chain. True / False

7. The suffix -ene shows a C≡C triple bond. True / False

8. In propan-1-ol the "e" of propane is dropped before -ol. True / False

9. The chain is numbered so that the principal group gets the highest locant. True / False

C. Assertion and reason

10. Assertion (A): Propanone has the suffix -one.
Reason (R): Its C=O group is inside the carbon chain.

(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): Butan-2-ol is numbered from the end nearer the OH group.
Reason (R): The principal group must get the lowest locant.

(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. The IUPAC name of $CH_3CH(OH)CH_3$ is:

(a) propan-1-ol
(b) propan-2-ol
(c) 2-propanol-1
(d) propanone

Answer: _____

13. Which prefix names a Cl atom on the chain?

(a) chloro
(b) chloride
(c) chlorine
(d) chloryl

Answer: _____

14. The IUPAC name of $CH_2=CHCH_3$ is:

(a) propane
(b) propene
(c) propyne
(d) propanal

Answer: _____

15. The IUPAC name of $CH_3–CH(CH_3)–CH_2OH$ is:

(a) butan-1-ol
(b) 2-methylpropan-3-ol
(c) 2-methylpropan-1-ol
(d) 1-methylpropan-2-ol

Answer: _____

E. Numerical problems

16. How many carbon atoms are in the parent chain of 2-methylbutane?

17. What is the locant of the OH group in butan-2-ol?

F. Short answer questions

18. Explain each part of the name 2-methylpropan-1-ol.

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. meth	(a) 1 carbon	1 → ____
2. but	(b) –CHO group	2 → ____
3. -yne	(c) C≡C triple bond	3 → ____
4. -al	(d) 4 carbons	4 → ____

Detailed solutions

1. prop

2. -ane

3. -ol

4. methyl

5. propanal

6. True. meth 1, eth 2, prop 3, but 4.

7. False. -ene is C=C; -yne is C≡C.

8. True. It is dropped before a suffix that starts with a vowel.

9. False. It gets the lowest locant.

10. (a) R explains A.

11. (a) R explains A.

12. (b) propan-2-ol. OH on the middle carbon.

13. (a) chloro. Halogens are named fluoro, chloro, bromo, iodo.

14. (b) propene. C=C gives -ene.

15. (c) 2-methylpropan-1-ol. Number from the –OH end.

16. but = 4 carbons in the parent chain. **Answer: 4**

17. Numbered from the nearer end. **Answer: 2**

18. 2-methyl: CH_3 branch on C2 (prefix); prop: 3-carbon parent chain (root); an: all single bonds (primary suffix); 1-ol: OH on C1 (secondary suffix).

19. 1 → (a), 2 → (d), 3 → (c), 4 → (b). Each part matches its meaning.