ANSWER KEY | Functional Groups and IUPAC Naming

Worked key for instructor review and student self-check. Credit sound chemical reasoning as well as the final result.

PART A: Multiple choice and application

1. What group appears in CH3COOCH3?

Correct: B. Ester

Explanation: An ester contains a carbonyl carbon bonded to an O-C group.

2. CH3CH(OH)CH2CH3 is named

Correct: A. Butan-2-ol

Explanation: Four-carbon parent with the hydroxyl at carbon 2.

3. What functional group is R-C=N?

Correct: A. Nitrile

Explanation: The carbon-nitrogen triple bond is a nitrile.

4. The carbonyl in a ketone is bonded directly to

Correct: A. Two carbon groups

Explanation: A ketone has an internal carbonyl carbon with two carbon substituents.

5. What is CH3CH(CH3)CH2CH2CH3?

Correct: A. 2-methylpentane

Explanation: The longest continuous chain is five carbons; number the methyl branch at 2.

6. The correct suffix for CH3COCH2CH3 is

Correct: B. -one

Explanation: It is butan-2-one, a ketone.

PART B: Drawing and reasoning

7. Draw 3-methylpentan-2-one and label the carbonyl and substituent.

Worked answer: CH3-C(=O)-CH(CH3)-CH2-CH3. Ketone carbonyl at C2; methyl substituent at C3.

8. Name CH3CH2CH(OH)CH3 and CH3COOCH3 and identify the functional groups.

Worked answer: Butan-2-ol (alcohol) and methyl ethanoate (ester). An ester contains C(=O)-O-C.

Equivalent chemically correct structures and mechanisms are acceptable.