MCQs (Circle the correct answer)

1. The main functional group present in both aldehydes and ketones is:
A) Hydroxyl group
B) Carbonyl group
C) Carboxyl group
D) Amino group

2. Which reagent is commonly used to detect both aldehydes and ketones?
A) Benedict's reagent
B) Fehling's solution
C) 2,4-Dinitrophenylhydrazine
D) Sodium hydroxide

3. Aldehydes differ from ketones mainly because they:
A) Are less reactive
B) Cannot be oxidized
C) Are easily oxidized to carboxylic acids
D) Do not contain carbonyl groups

4. A positive Tollens' test produces:
A) Blue solution
B) Yellow precipitate
C) Silver mirror
D) Green color

5. The oxidizing agent in Tollens' test contains:
A) Cu^{2+} ions
B) [redacted] $Ag(NH_3)_2^+$
C) Fe^{3+} ions
D) Na^+ ions

6. In Fehling's test, a positive result gives:
A) Blue precipitate
B) Dark red precipitate
C) White crystals
D) Silver mirror

7. Which compound will give a positive Fehling's test?
A) Acetone
B) Benzaldehyde
C) Formaldehyde
D) Ketones in general

8. The product formed in Fehling's test is:
A) CuO
B) Cu_2O
C) Ag
D) NaCl

9. The iodoform test gives a positive result indicated by:
A) Blue color
B) Silver mirror
C) Bright yellow precipitate

D) Green solution

10. Which compound is most likely to give a positive iodoform test?
A) Methanol
B) Acetone
C) Benzaldehyde
D) Ethanoic acid

11. The formation of derivatives like oximes involves:
A) Electrophilic substitution
B) Nucleophilic addition
C) Free radical reaction
D) Elimination only

12. What is eliminated during derivative formation?
A) CO■ 2
B) NH■ 3
C) H■O
2
D) O■
2

13. Why are derivatives useful in identification?
A) They are gases
B) They are unstable
C) They have sharp melting points
D) They are colorless

14. In identifying an unknown compound, the first test used is:
A) Iodoform test
B) Fehling's test
C) Tollens' test
D) Oxime formation

15. If a compound is identified as a ketone, the next step is:
A) Perform Tollens' test
B) Perform iodoform test
C) Add acid
D) Heat strongly

Fill in the blanks

1. Aldehydes and ketones both contain the _____ group.
2. 2,4-Dinitrophenylhydrazine produces a _____ precipitate.
3. Aldehydes are oxidized into _____ acids.
4. Tollens' test produces a _____ mirror.
5. Fehling's test produces _____ oxide (Cu_2O).
6. The iodoform test gives a _____ precipitate.
7. The mechanism of derivative formation involves _____ addition.
8. Water is _____ during derivative formation.
9. Derivatives are usually _____ solids.
10. Unknown compounds are first tested using _____ test.

Short Answer (Mention)

1. Mention two differences between aldehydes and ketones.
2. Mention two reagents used to distinguish aldehydes from ketones.
3. Mention two observations of a positive Tollens' test.
4. Mention two types of carbonyl derivatives.
5. Mention the steps used to identify an unknown carbonyl compound.

Answers

1. B
2. C
3. C
4. C
5. B
6. B
7. C
8. B
9. C
10. B
11. B
12. C
13. C
14. C
15. B

1. carbonyl
2. yellow to orange
3. carboxylic
4. silver
5. cuprous
6. yellow
7. nucleophilic
8. eliminated
9. crystalline
10. Tollens'

1. Aldehydes are easily oxidized to carboxylic acids, while ketones are not. Aldehydes give positive Tollens', Fehling's, and Benedict's tests, while ketones generally do not.

2. Tollens' reagent and Fehling's solution.

3. Formation of a silver mirror and formation of a dark grey precipitate.

4. Oximes and 2,4-Dinitrophenylhydrazones.

5. Perform Tollens' test, then if ketone perform iodoform test, then prepare a crystalline derivative and determine melting point.