CHEMISTRY

BOOKS - MBD -HARYANA BOARD

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Objective Type Questions Select The Correct Answer

1. What is the name of the following reaction :

$$RCOCl + H_2 \xrightarrow{pd - BaSO_4} RCHO + HCl$$

A. Stephen reaction

B. Rosenmund reaction

C. Etard reaction

D. Aldol condensation

Answer: B

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2. The solution used to preserve biological specimens is :

A. Tollen's Reagent

B. Formalin

C. Vanillin

D. Acetone.

Answer: B

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3. Which of the following cannot reduce Fehling solution ?

A. HCOOH

B. CH_3COOH

C. HCHO

D. CH_2CHO.

Answer: B

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4. Which is used to preserve biological specimens ?

A. Acetone

B. Chloroform

C. Ethanal

D. Formaldehyde.

Answer: D

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5.

$2HCHO + conc.\ NaOH \rightarrow CH_3OH + HCOONa$

is:

A. Cross aldol condensation

B. Aldol condensation

C. Cannizzaro reaction

D. Rosenmund's reaction.

Answer: C

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6. Methyl ketones are characterized through :

A. Tollen's reagent

B. Iadoform test

C. Schiff's test

D. None.

Answer: B

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7. $CH_3COCl + H_2 \xrightarrow[BaSO_4]{Pd} CH_3CHO + HCl$ is:

A. Cross aldol condensation

B. Aldol condensation

C. Cannizzaro reaction

D. Rosenmund's reaction

Answer: D

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8. The IUPAC name of Acetone is :

A. Propanal

B. Propanone

C. Propanol

D. None of these.

Answer: B

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9. Among the following which has lowest pKa values ?

A. HCOOH

B. CH_3COOH

C. $(CH_3)_2 - CH - COOH$

D. $CH_3 - CH_2 - COOH$

Answer: A

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10. Which of the following cannot reduce Tollen's reagent?

A. HCOOH

B. HCHO

C. CH_3CHO

D. CH_3COCH_3

Answer: D

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11. IUPAC name of acetic acid is :

A. Methanal

B. 2- Pentanone

C. Ethanoic acid

D. Methanoic acid.

Answer: D

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12. Which of the following cannot reduce Fehling solution ?

A. HCOOH

B. HCHO

C. CH_3CHO

D. CH_3COOH

Answer: C

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13. Which of the following reacts with water ?

A. $CHCl_3$

B. $Cl_3C - CHO$

C. CCl_4

D. $Cl - CH_2CH_2 - Cl$

Answer: B

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14. $C_6H_5 - CH = CH - CHO$ is

A. Benzaldehyde

B. Salicylaldehyde

C. Cinamaldehyde

D. None of these.

Answer: C

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15. Which is strongest acidic?

A. CH_3CH_2COOH

B. CH_3COOH

C. C_6H_5COOH

D. $C_6H_5CH_2COOH$

Answer: C

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16. Which is most acidic?

A. CCl_3COOH

B. $CHCl_2COOH$

C. $CH_2ClCOOH$

D. CH_3COOH

Answer: A

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17. $C_6H_5COC_6H_5$ is:

A. Benzophenone

B. Acetophenone

C. Cinnamaldehyde

D. None of these.

Answer: A

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18. HVZ reaction is used to prepare :

A. α -Halo acid

B. β-Halo acid

C. $\alpha - \beta$-Unsaturated acid

D. None of these.

Answer: A

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19. Which of the following does not undergo Aldol condensation ?

A. $Cl - CH_2 - CHO$

B. $CCl_3 - CHO$

C. $C_6H_5 - CH_2 - CHO$

D. $CH_3 - CHO$

Answer: B

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20. Strongest acid is:

A. CH_3COOH

B. $CH_3CHClCOOH$

C. CH_3CH_2COOH

D. $CH_2ClCH_2CH_2COOH$

Answer: B

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Very Short Answer Type Questions

1. What is meant by cyanohydrin ?

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2. Write Clemmenson reduction.

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3. Write Cannizzaro's reaction.

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4. The IUPAC name of  is:

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5. Which product is formed when calcium formate is distilled ?

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6. The IUPAC name of  is:

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7. How will you convert acetone to 2-methyl-2-propanol ?

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8. Which type of aldehydes undergo Cannizzaro's reaction ?

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9. What is Hofmann's reduction reaction ?

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10. What happens when acetyl chloride reduced with $LiAlH_4$?

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11. Draw structure of cyclopropanone oxime.

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12. How will you convert acetaldehyde to methane ?

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13. Complete the reaction:

$HCHO \xrightarrow{NaOH\,(50\%)}$.

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14. Draw the structure of propane-1, 2, 3 tricarbaldehyde.

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15. Write IUPAC name of the compound  .

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Short Answer Type Questions

1. Complete the reactions :

(i) 

(ii) $C_6H_5CHO \xrightarrow{H_2NCONHNH_3}$

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2. Describe the following :

(i) Cross-aldol condensation,

(ii) Haloform reaction.

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3. Discuss the following reactions :

(i) HVZ reaction.

(ii) Decarboxylation reaction.

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4. Write the chemical reaction of a carboxylic acid with:

(a) Na_2CO_3 (b) PCl_5 (c) NH_3.

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5. Give the formula of A and B:

$$CH_3 - \overset{\overset{O}{||}}{C} - OH \xrightarrow{SOCl_2} A \xrightarrow{LiAlH_4} B$$

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6. Write the IUPAC name of $(CH_3CH_2)_2NCH_3$:

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7. Complete the following reaction:

(i) $CH_3 - \underset{\underset{O}{||}}{C} - CH_3 \xrightarrow[\text{Dry ether}]{CH_3, MgBr} A \xrightarrow[H_2O]{H^+} B$

(ii) $CH_3 - CH_2 - CH_2 - CHO \xrightarrow{H_2 / Ni} A$

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8. Complete the following reaction:

(i) $R - CH_2 - COOH \xrightarrow[H_2O]{+X_2 / \text{Red P}}$

(ii) $2CH_3COOH \xrightarrow{\Delta\ ,P_2O_5}$

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9. Why dipole moments of aldehydes and ketones are higher than alcohols ?

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10. (a) Write IUPAC names of the following:

(i) HOOC-COOH

(ii) 

(b) Complete the following:

$$C_6H_5CH_2OH \xrightarrow{HBr} ? \xrightarrow{KCN} ? \xrightarrow[\Delta]{H_3O^+} ?$$

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11. Why aldehydes are more reactive than ketones

?

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12. (a) Write IUPAC names of the following:

(i) $HOOC - CH_2 - COOH$

(ii) 

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13. Write the chemical reaction of carbonyl group with

(i) H_2O (ii) HCN (iii) $Na^+HSO_3^-$

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14. How is acetone prepared from isopropyl alcohol?

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15. What happens when calcium acetate is dry distilled ?

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16. Aldehydes have higher boiling points than alkanes of similar molecular weight, give suitable

reasons.

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17. Lower members of aldehydes are soluble in water where as the higher members are not. Give reasons.

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18. Point out the difference between addition reactions in alkenes and carbonyl compounds.

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19. (a) Discuss briefly the following reactions :

(i) Gattermann Koch reaction

(ii) Rosenmund reaction.

(b) Trichloro acetic acid is stronger acid than dichloro acetic acid. Explain.

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20. Why is it necessary to control the pH during the addition of ammonia derivative reaction of aldehydes and ketones with ammonia derivative.

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21. Identify A from the following:

(i)

$$C_6H_5COCH_3 \xrightarrow{A} C_6H_5COOH + CO_2 + H_2O$$

(ii) $C_6H_5COCH_3 \xrightarrow{A} C_6H_5 - \underset{\displaystyle OH}{\overset{\displaystyle H}{\overset{|}{\underset{|}{C}}}} - C_6H_5$

(iii) $C_6H_5COCH_3 \xrightarrow{A} C_6H_5CH_2CH_3 + H_2O$

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22. Benzophenone does not react with $NaHSO_3$. Explain.

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23. Why are aliphatic carboxylic acids stronger than phenols?

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24. Explain the term ozonolysis with an example.

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25. What information can be obtained on the structure of alkene on ozonolysis ?

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26. By means of suitable chemical test, how will you distinguish acetophenone and benzophenone.

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27. Give two tests for aldehyde.

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28. By means of a suitable chemical test, how will you distinguish an aldehyde from that of a ketone ?

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29. Which type of aldehydes undergo aldol condensation. Give an example.

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30. Write a note on Clemmensen reduction.

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31. What is formalin ? Give its use.

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32. What happens when formaldehyde reacts with ammonia ?

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33. How are aldehydes distinguished from ketones using Tollen's and Fehling's reagents ? Give complete chemical reactions.

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34. Write the IUPAC names of :

(i) $CH_3\underset{Br}{\underset{|}{C}}H - COOH$ (ii) $\overset{COOH}{\overset{|}{C}}H_2 - \overset{COOH}{\overset{|}{C}}H_2$

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35. Write the IUPAC names of the following:

(i) $CH_3 - CH(CH_3) - CHO$

(i) $C_6H_5 - CH_2 - CHO$

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Long Answer Type Questions

1. (a) How will you distinguish between Pentan-2-one and Pentan-3-one with the help of Iodoform test ?

(b) How will you bring about following conversions ?

(i) Benzoic acid to m-Nitrobenzyl alcohol.

(ii) Benzaldehyde to Benzophenone.

(iii) Benzoic acid to Benzamide.

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2. Describe the following:

(a) Aldol condensation

(b) Decarboxylation.

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3. Write the chemical reactions of CH_3COCH_3 with the following:

(i) $NH_2 - OH$ (ii) HCN

(iii) R - MgX (iv) $NaHSO_3$

(v) $Zn - Hg / HCl$

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4. Discuss the following reactions of aldehydes and ketones :

(a) Oxidation (b) Reduction.

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5. (a) Discuss the important physical properties of carboxylic acids.

(b) Discuss the structure of carboxylic acids. How do you account for acidic character of carboxylic acids ?

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6. Discuss the general chemical properties of carboxylic acids.

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7. (a) Complete the following reactions:

(i) $CH \equiv CH + H_2O \xrightarrow[HgSO_4, 333K]{Dil.\ H_2SO_4} ?$

(ii) $CH_3CHO + HCN \rightarrow ?$

(iii) $HCHO + NaOH \rightarrow ?$

(b) How will you prepare RCOOH from?

(i) Alcohol

(ii) Nitrile.

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8. (a) Convert benzene into

(i) Acetophenone (ii) Benzaldehyde

(iii) Benzophenone.

(b) Write a note on aldol condensation.

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