

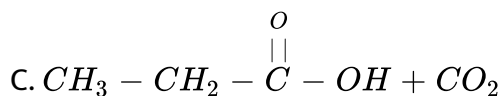
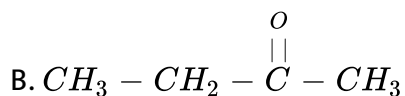
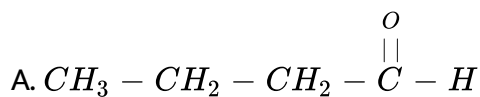
CHEMISTRY

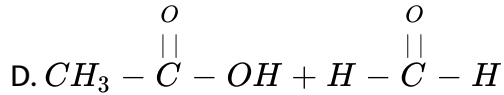
BOOKS - NCERT CHEMISTRY (ENGLISH)

ALDEHYDE, KETONES AND CARBOXYLIC ACIDS

Mcqs

1. Addition of water to alkynes occurs in acidic medium and in the presence of Hg^{2+} ions as a catalyst. Which of the following products will be formed on addition of water to but-1-yne under these conditions?

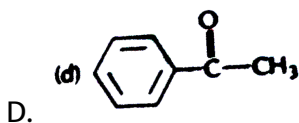
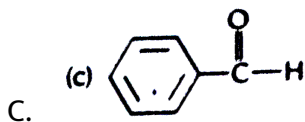
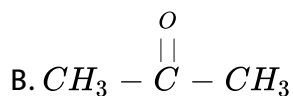
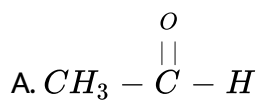




Answer: B

 Watch Video Solution

2. Which of the following compounds is the most reactive towards nucleophilic addition reactions?



Answer: A

 Watch Video Solution

3. The correct order of increasing acidic strength is

A. phenol < ethanol < chloroacetic acid < acetic acid

B. ethanol < phenol < chloroacetic acid < acetic acid

C. ethanol < phenol < acetic acid < chloroacetic acid

D. chloroacetic acid < acetic acid < phenol < ethanol

Answer: C



Watch Video Solution

4. Compound $Ph - O - \overset{O}{\parallel} C - Ph$ can be prepared by the reaction of _____.

A. Phenol and benzoic acid in the presence of NaOH

B. phenol and benzoyl chloride in the presence of pyridine

C. phenol and benzoyl chloride in the presence of $ZnCl_2$

D. phenol and benzaldehyde in the presence of palladium

Answer: B

 [Watch Video Solution](#)

5. The reagent which does not react with both, acetone and benzaldehyde is _____ .

A. Sodium hydrogen sulphite

B. Phenyl hydrazine

C. Fehling's solution

D. Grignard reagent

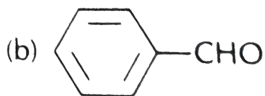
Answer: C

 [Watch Video Solution](#)

6. Cannizzaro's reaction is not given by



A.



B.

C. HCHO

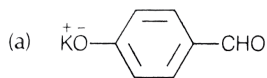
D. CH_3CHO

Answer: D

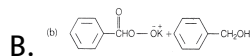


Watch Video Solution

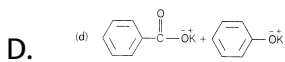
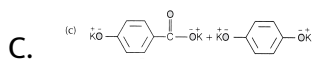
7. Which product is formed when the compound is treated with concentrated aqueous KOH solution ?



A.

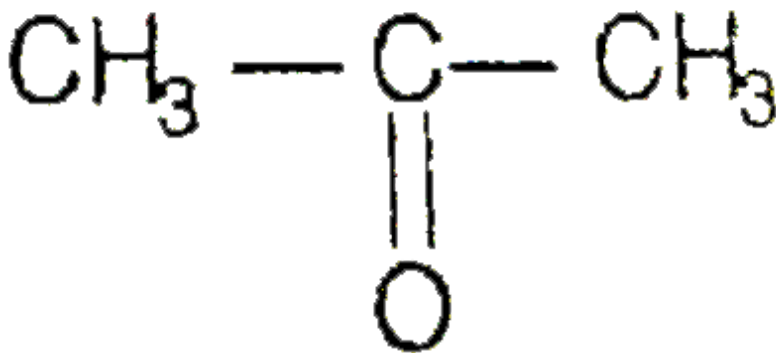
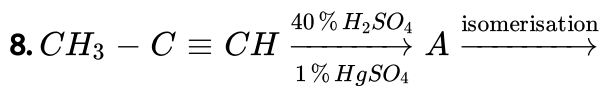


B.



Answer: B

Watch Video Solution



Structure of A and type of isomerism in the above reaction respectively are

A. Prop-1-en-2-01, metamerism

B. Prop-1-en-1-01, tautomerism

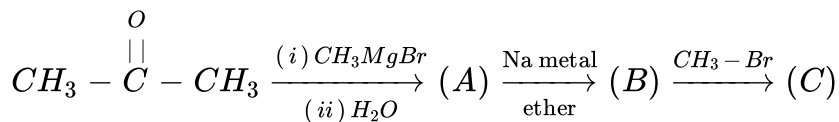
C. Prop-2-en-2-01, geometrical isomerism

D. Prop-1-en-2-01, tautomerism

Answer: D

 [Watch Video Solution](#)

9. Complete the following reaction sequence :



A. Identical

B. positional isomers

C. functional isomers

D. optical isomers

Answer: B

 [Watch Video Solution](#)

10. Which is the most suitable reagent for the following conversion ?



- A. Tollen's reagent
- B. Benzoyl peroxide
- C. I_2 and $NaOH$ solution
- D. Sn and $NaOH$ solution

Answer: C



Watch Video Solution

11. Which of the following compound will give butanone on oxidation with alkaline $KMnO_4$ solution ?

- A. Butan-1-ol

B. Butan-2-01

C. Both (a) and (b)

D. None of these

Answer: B

 [Watch Video Solution](#)

12. In Clemmensen reduction, carbonyl compound is treated with

A. zinc amalgam + HCl

B. sodium amalgam + HCl

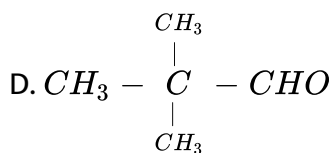
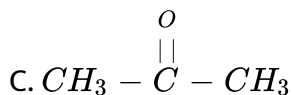
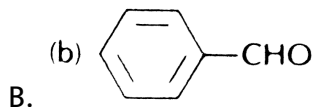
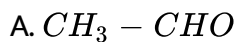
C. zinc amalgam + nitric acid

D. sodium amalgam + HNO_3

Answer: A

 [Watch Video Solution](#)

13. Which of the following will not undergo aldol condensation ?



Answer: B::D

 [Watch Video Solution](#)

14. Treatment of compound $Ph - O - \overset{O}{\parallel} C - Ph$

with NaOH solution yields

A. phenol

B. sodium phenoxide

C. sodium benzoate

D. benzophenone

Answer: B::C

 [Watch Video Solution](#)

15. Which of the following conversion can be carried out by Clemmensen reduction ?

A. Benzaldehyde into benzyl alcohol

B. Cyclohexanone into cyclohexane

C. Benzoyl chloride into benzaldehyde

D. Benzophenone into diphenyl methane

Answer: B::D

 [Watch Video Solution](#)

16. Through which of the following reactions number of carbon atoms can be increased in the chain ?

- A. Grignard reaction
- B. Cannizzaro's reaction
- C. Aldol condensation
- D. HVZ reaction

Answer: A::C



Watch Video Solution

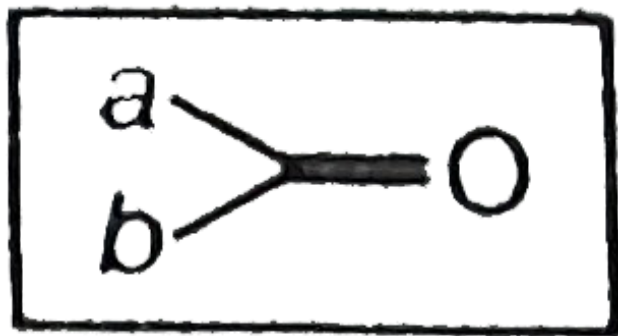
17. Benzophenone can be obtained by

- A. benzoyl chloride + benzene + $AlCl_3$
- B. benzoyl chloride + diphenyl cadmium
- C. benzoyl chloride + phenyl magnesium chloride
- D. benzene + carbon monoxide + $ZnCl_2$

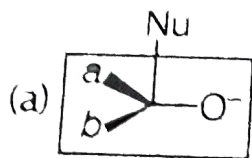
Answer: A

 Watch Video Solution

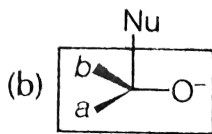
18. Which of the following is the correct representation for intermediate of nucleophilic addition reaction to the given carbonyl compound (A) ?



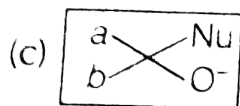
(A)



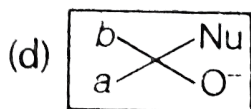
A.



B.



C.



D.

Answer: A:B

 [Watch Video Solution](#)

Short Answer Type Questions

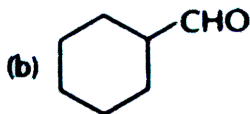
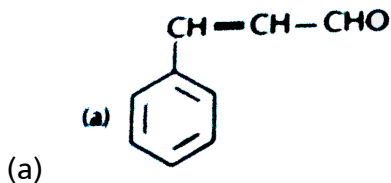
1. Why is there a large difference in the boiling points of butanal and butan-1-ol ?

 [Watch Video Solution](#)

2. Write a test to differentiate between pentan-2-one and pentan-3-one.

 [Watch Video Solution](#)

3. Give the IUPAC names of the following compounds.



 [Watch Video Solution](#)

4. Give the structure of the following compounds :

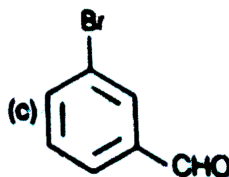
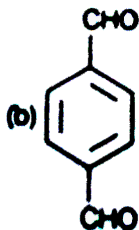
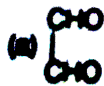
(i) 4-Nitropropiophenone

(ii) 2-Hydroxycyclopentanecarbaldehyde

(iii) Phenyl acetaldehyde.

 [Watch Video Solution](#)

5. Write IUPAC names of the following structures



[▶ Watch Video Solution](#)

6. Benzaldehyde can be obtained from benzalchloride. Write reactions for obtaining benzalchloride and then benzaldehyde from it.

[▶ Watch Video Solution](#)

7. Name the electrophile produced in the reaction of benzene with benzoyl chloride in the presence of anhydrous $AlCl_3$. Name the reaction also.

[▶ Watch Video Solution](#)

8. Oxidation of ketones involves carbon-carbon bond cleavage. Name the products formed on oxidation of 2, 5-dimethylhexan-3-one.

 [Watch Video Solution](#)

9. Arrange the following in decreasing order of their acidic strength and give reason for your answer.



 [Watch Video Solution](#)

10. What product will be formed on reaction of propanal with 2-methylpropanal in the presence of NaOH? Write the name of the reaction also.

 [Watch Video Solution](#)

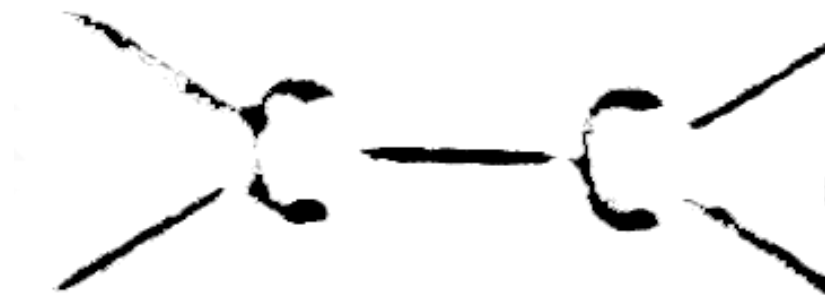
11. Compound 'A' is prepared by oxidation of compound 'B' with alkaline $KMnO_4$. Compound 'A' on reduction with lithium aluminium hydride gets converted back to compound 'B'. When compound 'A' is heated with compound 'B' in the presence of H_2SO_4 , it produces fruity smell of compound 'C'. To which family, the compounds 'A', 'B' and 'C' belong to ?

 [Watch Video Solution](#)

12. Arrange the following in decreasing order of their acidic strength. Give explanation for the arrangement.

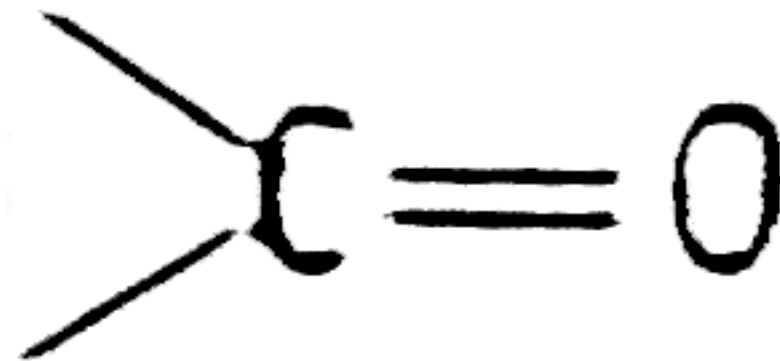


 [Watch Video Solution](#)



13. Alkenes

and carbonyl compounds



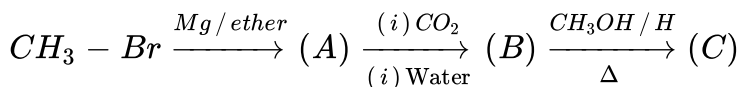
both contain a π bond but alkenes show electrophilic addition reactions whereas carbonyl compounds show nucleophilic addition reactions. Explain.

 [Watch Video Solution](#)

14. Carboxylic acids contain carbonyl group but do not show the nucleophilic addition reactions like aldehydes or ketones. Why?

 [Watch Video Solution](#)

15. Identify the compounds A, B and C in the following reaction :

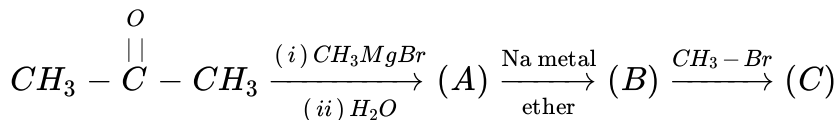


 [Watch Video Solution](#)

16. Why are carboxylic acids more acidic than alcohols or phenols although all of them have hydrogen atom attached to a oxygen atom (-O-H)?

 [Watch Video Solution](#)

17. Complete the following reaction sequence :



 [Watch Video Solution](#)

18. Ethylbenzene is generally prepared by acetylation of benzene followed by reduction and not by the direct alkylation of benzene. Think of a possible reason.

 [Watch Video Solution](#)

19. Can Gattermann-Koch reaction be considered similar to Friedel Craft's acylation ? Discuss.

 [Watch Video Solution](#)

20. Match the common names given in Column I with the IUPAC names given in Column II.

Column I (Common names)	Column II (IUPAC names)
A. Cinnamaldehyde	1. Pentanal
B. Acetophenone	2. Prop-2-en-al
C. Valeraldehyde	3. 4-methylpent-3-en-2-one
D. Acrolein	4. 3-phenylprop-2-en-al
E. Mesityl oxide	5. 1-phenylethanone

 [Watch Video Solution](#)

21. Match the acids given in Column I with their correct IUPAC names given in Column II.

Column I (Acids)	Column II (IUPAC names)
A. Phthalic acid	1. Hexane-1, 6-dioic acid
B. Oxalic acid	2. Benzene-1, 2-dicarboxylic acid
C. Succinic acid	3. Pentane-1, 5-dioic acid
D. Adipic acid	4. Butane-1, 4-dioic acid
E. Glutaric acid	5. Ethane-1, 2-dioic acid

 [Watch Video Solution](#)

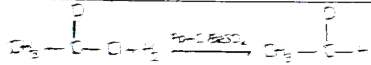
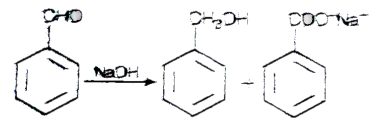
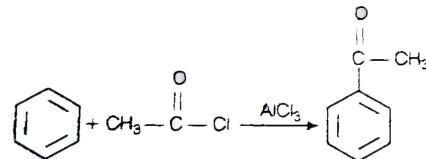
22. Match the reactions given in Column I with the suitable reagents given in Column II.

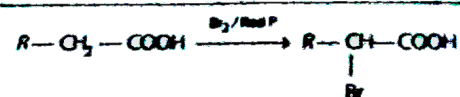
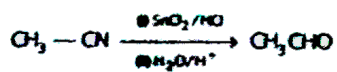
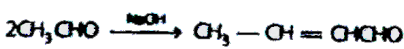
Column I (Reactions)	Column II (Reagents)
A. Benzophenone → Diphenylmethane	1. LiAlH_4
B. Benzaldehyde → 1-phenylethanol	2. DIBAL-H
C. Cyclohexanone → Cyclohexanol	3. Zn(Hg)/Conc. HCl
D. Phenyl benzoate → Benzaldehyde	4. CH_3MgBr



Watch Video Solution

23. Match the example given in Column I with the name of the reaction in Column II.

Column I (Example)	Column II (Reaction)
A. 	1. Friedel-Crafts acylation
B. 	2. HVZ reaction
C. 	3. Aldol condensation

Column I (Example)	Column II (Reaction)
D. 	4. Cannizzaro's reaction
E. 	5. Rosenmund's reduction
F. 	6. Stephen's reaction

 Watch Video Solution

24. Assertion (A) Formaldehyde is a planar molecule.

Reason (R) It contains sp^2 hybridised carbon atom.

A. If both (A) and (R) are correct and (R) is the correct explanation of

(A).

B. If both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If (A) is incorrect, but (R) is correct.

Answer: a

 [Watch Video Solution](#)

25. Assertion (A) compound containing -CHO group are easily oxidised to corresponding carboxylic acids

Reason (R) : Carboxylic acids can be reduced to alcohols by treatment with $LiAlH_4$

A. If both assertion and reason are CORRECT, and reason is the CORRECT explanation of the assertion

B. If both assertion and reason are CORRECT, but reason is NOT the CORRECT explanation of the assertion

C. If assertion is CORRECT but reason is INCORRECT

D. If assertion is INCORRECT but reason is CORRECT

Answer: d

 [Watch Video Solution](#)

26. Assertion (A) The α -hydrogen atom in carbonyl compounds is less acidic.

Reason (R) The anion formed after the loss of α -hydrogen atom is resonance stabilised.

 [Watch Video Solution](#)

27. Assertion : Aromatic aldehydes and formaldehyde undergo Cannizzaro reaction

Reason : Aromatic aldehydes are almost as reactive as formaldehyde.

 [Watch Video Solution](#)

28. Assertion (A) Aldehydes and ketones, both react with Tollen's reagent to form silver mirror.

Reason (R) Both, aldehydes and ketones contain a carbonyl group.

 [Watch Video Solution](#)

Long Answer Type Questions

1. An alkene 'A' (molecular formula C_5H_{10}) on ozonolysis gives a mixture of two compounds 'B' and 'C'. Compound 'B' gives positive Fehling's test and also forms iodoform on treatment with I_2 and $NaOH$. Compound 'C' does not give Fehling's test but forms iodoform. Identify the compounds A, B and C. Write the reaction for ozonolysis and formation of iodoform from B and C.

 [Watch Video Solution](#)

2. An aromatic compound 'A' (Molecular formula C_8H_8O) gives positive 2, 4-DNP test. It gives a yellow precipitate of compound 'B' on treatment with iodine and sodium hydroxide solution. Compound 'A' does not give Tollen's or Fehling's test. On drastic oxidation with potassium permanganate, it forms a carboxylic acid 'C' (Molecular formula $C_7H_6O_2$), which is also formed along with the yellow compound in the above reaction. Identify A, B and C and write all the reactions involved.

 [Watch Video Solution](#)

3. Write down functional isomers of a carbonyl compound with molecular formula C_3H_6O . Which isomer will react faster with HCN and why? Explain the mechanism of the reaction also. Will the reaction lead to the completion with the conversion of whole reactant into product under reaction conditions? If a strong acid is added to the reaction mixture, what will be the effect on concentration of the product and why?

 [Watch Video Solution](#)

4. When liquid 'A' is treated with a freshly prepared ammoniacal silver nitrate solution it gives bright silver mirror. The liquid forms a white crystalline solid on treatment with sodium hydrogen sulphate. Liquid 'B' also forms a white crystalline solid with sodium hydrogen sulphate. but it does not give test with ammoniacal silver nitrate. Which of the two liquids is aldehyde? Write the chemical equations of these reactions also.



[Watch Video Solution](#)