

DCAM Classes for IIT-JEE

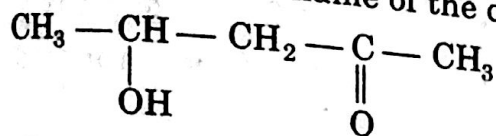
Aldehyde, Ketones and carboxylic acid-CBSE

1 Mark Questions

1. Write the IUPAC name of the following:
 $\text{CH}_3 - \text{CH}_2 - \text{CHO}$

2. Draw the structure of 3-methylpentanal.

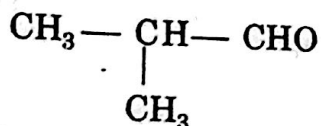
3. Write the IUPAC name of the compound



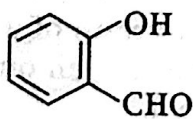
4. Write the structure of *p*-methylbenzaldehyde

5. Give a test to distinguish between propan-2-one and pentan-3-one.

6. Write the IUPAC name of the following compound :



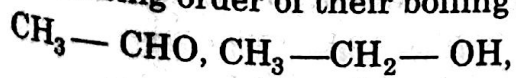
7. Write the IUPAC name of the following compound :



8. Write the structure of 3-methylbutanal.

9. Write the structure of 4-chloropentan-2-one.

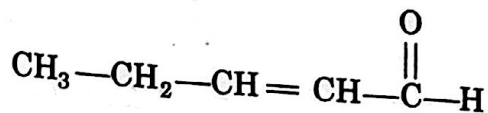
10. Rearrange the following compounds in the increasing order of their boiling points.



11. Draw the structure of the compound named 4-methylpent-3-en-2-one.

12. How will you carry out the following conversion?
 Ethanol to acetone

13. Write the IUPAC name of the following :



14. Give chemical test to distinguish between benzophenone and acetophenone.

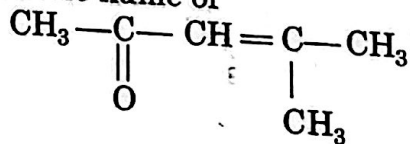
15. Arrange the following compounds in an increasing order of their reactivity in nucleophilic addition reactions:
 Ethanal, propanal, propanone, butanone.

16. Illustrate the following reaction giving a suitable example :
 Cross aldol condensation

17. Give simple tests to distinguish between the following pair of compounds:
 Pentan-2-one and pentan-3-one

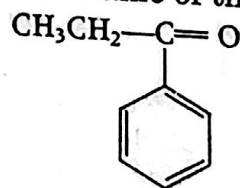
18. Illustrate the following name reaction giving suitable example :
 Clemmensen reduction

19. Write the name of



20. Write the structure of 3-oxopentanal.

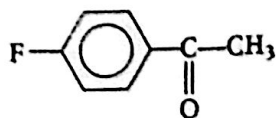
21. Write IUPAC name of the following :



22. Illustrate the name reaction:
 Wolff-Kishner reduction.

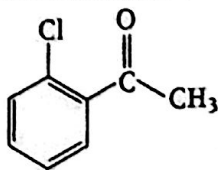
23. Draw the structure of 1-phenyl propan-1-one.

24. Write IUPAC name of



25. What is Tollen's reagent? Write one usefulness of this reagent.

26. Write the IUPAC name of the following :



2 Marks Questions

27. Write the equations involved in the following reactions :

- (i) Wolff-Kishner reduction.
- (ii) Etard reaction.

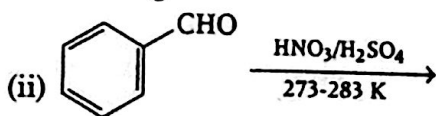
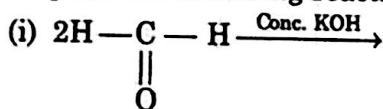
28. Write the reactions involved in the following reactions:

- (i) Clemmensen reduction
- (ii) Cannizzaro reaction

29. How are the following conversions carried out?

- (i) Propene to propan-2-ol.
- (ii) Ethyl chloride to ethanal.

30. Complete the following reactions:



31. Give a possible explanation for each one of the following :

- (i) There are two $-\text{NH}_2$ groups in semicarbazide. However, only one such group is involved in the formation of semicarbazones.
- (ii) Cyclohexanone forms cyanohydrins in good yield but 2,2,6-trimethyl cyclohexanone does not.

32. Explain the mechanism of a nucleophilic attack on the carbonyl group of an aldehyde or a ketone.

3 Marks Questions

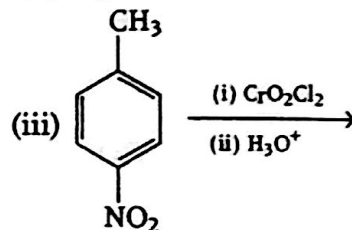
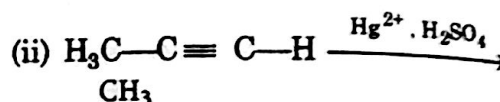
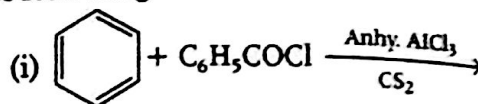
33. Write the equations involved in the following reactions:

- (i) Stephen reaction.
- (ii) Wolff-Kishner reaction.
- (iii) Etard reaction.

34. How will you bring about the following conversions?

- (i) Propanone to propane.
- (ii) Benzoyl chloride to benzaldehyde.
- (iii) Ethanal to but-2-enal.

35. Write the structures of the main products of following reactions :



36. (i) Describe the mechanism of the addition of Grignard's reagent to the carbonyl group of a compound to form an adduct which on hydrolysis yield an alcohol.

(ii) Draw the structure of the following compounds :

- (a) 3-methylbutanal
- (b) *p*-nitropropiophenone

37. (i) Illustrate the following reaction giving suitable chemical equations: Cannizzaro reaction

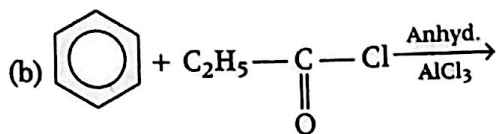
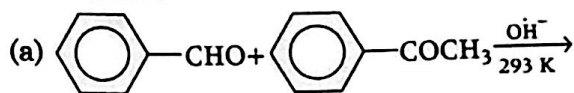
(ii) How would you bring about the following conversions? Write the complete equations in each case.

- (a) Ethanal to 3-hydroxybutanal
- (b) Benzaldehyde to benzophenone

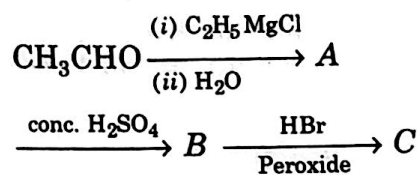
5 Marks Questions

38. (i) Draw the structures of the following derivatives:
- Propanone oxime
 - Semicarbazone of CH_3CHO
- (ii) How will you convert ethanal into the following compounds? Give the chemical equations involved:
- $\text{CH}_3 - \text{CH}_3$
 - $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \text{CH}_2 - \text{CHO}$
 - $\text{CH}_3\text{CH}_2\text{OH}$
39. (i) Describe :
- Aldol condensation
 - Cannizzaro reaction
- (ii) Describe a chemical test to distinguish between
- ethanal and propanal
 - benzaldehyde and acetophenone
 - propan-2-one and pentan-3-one
40. (i) An organic compound with molecular formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous oxidation, it gives 1, 2-benzenedicarboxylic acid. Identify the compound.
- (ii) Give the chemical tests to distinguish between
- propanol and propanone
 - benzaldehyde and acetophenone
- (iii) Arrange the following compounds in an increasing order of their property as indicated :
- Acetaldehyde, acetone, methyl *tert*-butyl ketone (reactivity towards HCN).
41. (i) An organic compound $A (\text{C}_3\text{H}_8\text{O})$ on treatment with copper at 573 K gives B . B does not reduce Fehling's solution but gives a yellow ppt. of compound C with I_2 / NaOH . Deduce the structures of A , B , and C .

- (ii) Predict the products of the following reactions :



42. (i) Identify A , B and C in the following sequence of reactions:

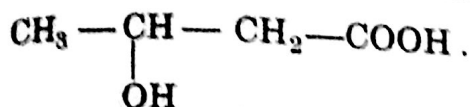


- (ii) Predict the structures of products formed when benzaldehyde is treated with
- conc. NaOH
 - $\text{HNO}_3 / \text{H}_2\text{SO}_4$ (at 273 - 383 K)

43. A ketone $A (\text{C}_4\text{H}_8\text{O})$ which undergoes a haloform reaction gives compound B on reduction. B on heating with sulphuric acid gives a compound C which forms mono-ozonide D . D on hydrolysis with zinc dust gives only E . Identify A , B , C , D and E . Write the reactions involved.

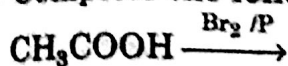
1 Mark Questions

1. Write the IUPAC name of the compound



2. Write the structure of 2-hydroxybenzoic acid.

3. Complete the following reaction:



4. Give chemical tests to distinguish between phenol and benzoic acid.

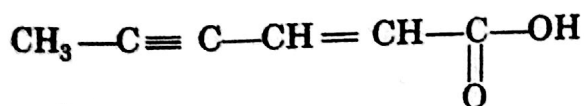
5. Illustrate the following reaction giving a suitable example : Decarboxylation

6. Draw the structure of the following compound : Hexane-1, 6-dioic acid.

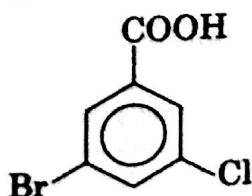
7. Illustrate the following name reaction giving suitable example; Hell-Volhard-Zelinsky reaction.

8. How would you complete the following conversion? Write the complete equation. Benzoic acid to *m*-nitrobenzyl alcohol.

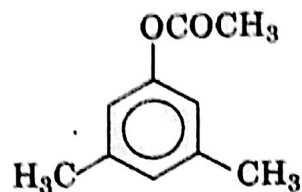
9. Write IUPAC name of



10. Write IUPAC name of



11. Write IUPAC name of



12. How will you convert benzoic acid to benzaldehyde?

2 Marks Questions

13. Write the reactions involved in the following:

- Hell-Volhard Zelinsky reaction
- Decarboxylation reaction

14. Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol. Give two reasons.

15. How will you carry out the following conversions?

- Acetylene to acetic acid
- Toluene to *m*-nitrobenzoic acid

16. Arrange the following compounds in an increasing order of their property as indicated:

- Benzoic acid, 3,4-dinitrobenzoic acid, 4-methoxybenzoic acid (acidic strength)
- $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{COOH}$, $\text{CH}_3\text{CH}(\text{Br})\text{CH}_2\text{COOH}$, $(\text{CH}_3)_2\text{CHCOOH}$ (acidic strength)

3 Marks Questions

17. How are the following conversions carried out?

- Ethyl cyanide to ethanoic acid
- Butan-1-ol to butanoic acid
- Benzoic acid to *m*-bromobenzoic acid

- 18.** An organic compound *A* (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid *B* and an alcohol *C*. Oxidation of *C* with chromic acid also produced *B*. On dehydration *C* gives but-1-ene. Write the equations for the reactions involved.

MISCELLANEOUS QUESTIONS

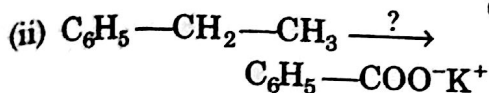
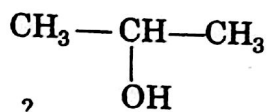
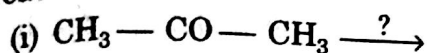
1 Mark Questions

1. An aromatic organic compound 'A' with molecular formula C_9H_8O gives positive DNP and iodoform tests. It neither reduces Tollens' reagent nor does it decolourise bromine water. Write the structure of 'A'.
2. Draw the structure of 2-methylbutanal.

2 Marks Questions

3. How do you convert the following?
 - (i) Ethanal to propanone
 - (ii) Toluene to benzoic acid
4. Account for the following :
 - (i) Aromatic carboxylic acids do not undergo Friedel-Crafts reaction.
 - (ii) pK_a value of 4-nitrobenzoic acid is lower than that of benzoic acid.
5. Write the reagents required in the following reactions :
 - (i) $CH_2=CH-CH_2OH \xrightarrow{?}$
 $CH_2=CH-CHO$
 - (ii) $CH_3-COOH \xrightarrow{?} CH_3-CONH_2$
6. Arrange the following compounds in the increasing order of their property as indicated.
 - (i) CH_3COCH_3 , $C_6H_5COCH_3$, CH_3CHO
(reactivity towards nucleophilic addition reaction)
 - (ii) $Cl-CH_2-COOH$, $F-CH_2-COOH$,
 CH_3-COOH (acidic character)

7. Name the reagents used in the following reactions.



8. Give reasons:

- chloroacetic acid is stronger than acetic acid.
- pH of reaction should be carefully controlled while preparing ammonia derivatives of carbonyl compounds.

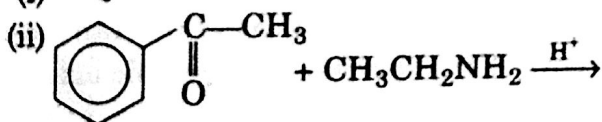
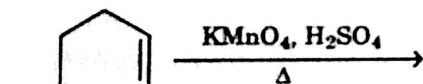
9. Give simple chemical tests to distinguish between the following pairs of compounds:

- Ethanal and propanal.
- Benzoic acid and phenol.

10. Give chemical tests to distinguish between the following pairs of compounds:

- Propanal and propanone.
- Benzaldehyde and benzoic acid.

11. Predict the products.

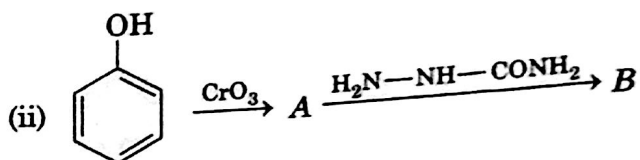
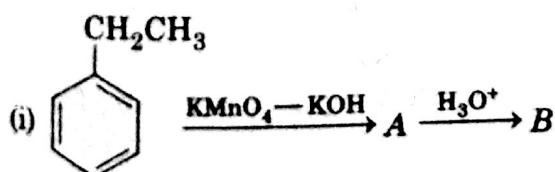


12. Give chemical tests to distinguish between

- ethanol and propanol.
- benzoic acid and ethyl benzoate.

3 Marks Questions

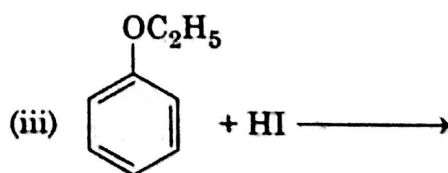
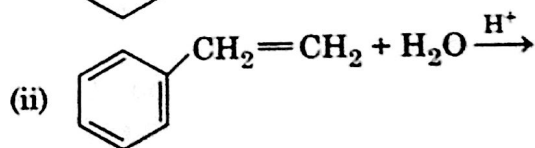
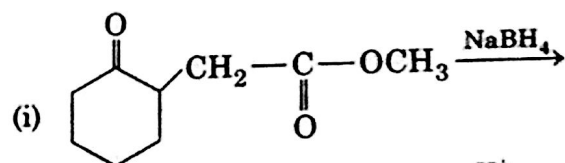
13. Write structures of compounds A and B in each of the following reactions:



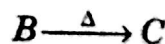
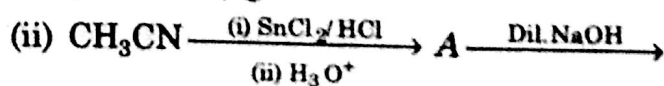
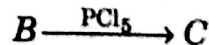
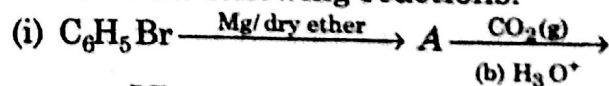
14. A, B and C are three non-cyclic functional isomers of a carbonyl compound with molecular formula $\text{C}_4\text{H}_8\text{O}$. Isomers A and C give positive Tollens' test whereas isomer B does not give Tollens' test, but gives positive iodoform test. Isomers A and B on reduction with $\text{Zn}(\text{Hg})/\text{conc. HCl}$ give the same product D.

- Write the structures of A, B, C and D.
- Out of A, B and C isomers, which one is least reactive towards addition of HCN?

15. Write the structures of the main products in the following reactions:



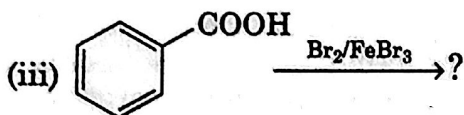
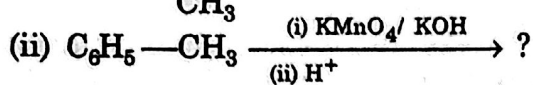
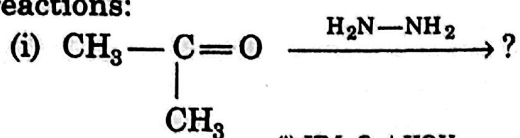
16. Write structures of compounds A, B and C in each of the following reactions:



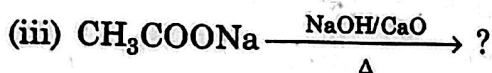
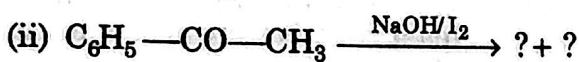
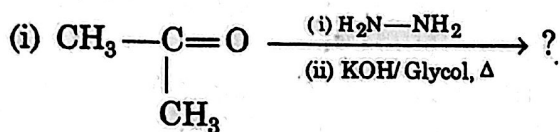
17. Do the following conversions in not more than two steps:

- Benzoic acid to benzaldehyde.
- Ethyl benzene to benzoic acid.
- Propanone to propene.

18. Predict the products of the following reactions:



19. Predict the products of the following reactions:



20. How do you convert the following?

(i) Benzoic acid to benzaldehyde.

(ii) Ethyne to ethanal.

(iii) Acetic acid to methane.

21. Two moles of organic compound *A* on treatment with a strong base gives two compounds *B* and *C*. Compound *B* on dehydrogenation with *Cu* gives *A* while acidification of *C* yields carboxylic acid *D* with molecular formula of CH_2O_2 . Identify the compounds *A*, *B*, *C* and *D* and write all chemical reactions involved.

22. An organic compound (*A*) which has characteristic odour, on treatment with NaOH forms two compounds (*B*) and (*C*). Compound (*B*) has the molecular formula $\text{C}_7\text{H}_8\text{O}$ which on oxidation with CrO_3 gives back compound (*A*). Compound (*C*) is the sodium salt of the acid. Compound (*C*) when heated with soda lime yields an aromatic hydrocarbon (*D*). Deduce the structures of (*A*), (*B*), (*C*) and (*D*). Write chemical equations for all reaction taking place.

23. An organic compound (*A*) with molecular formula $\text{C}_8\text{H}_8\text{O}$ forms an orange red

precipitate with 2, 4-DNP reagent and gives yellow precipitate on heating with I_2 and NaOH . It neither reduce Tollens' reagent nor Fehling's reagent, nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid (*B*) having molecular formula $\text{C}_7\text{H}_6\text{O}_2$. Identify the compounds (*A*) and (*B*) and explain the reactions involved.

24. An organic compound with molecular formula $\text{C}_5\text{H}_{10}\text{O}$ does not reduce Tollens' reagent but forms an addition compound with sodium hydrogen sulphite and gives a positive iodoform test. On vigorous oxidation, it gives ethanoic acid and propanoic acid. Identify the compound and write all chemical equations for the reactions.

25. A compound *A* ($\text{C}_2\text{H}_6\text{O}$) on oxidation by PCC gave *B*, which on treatment with aqueous alkali and subsequent heating furnished *C*. *B* on oxidation by KMnO_4 , forms a monobasic carboxylic acid with molar mass 60 g mol^{-1} . Deduce the structures of *A*, *B* and *C*.

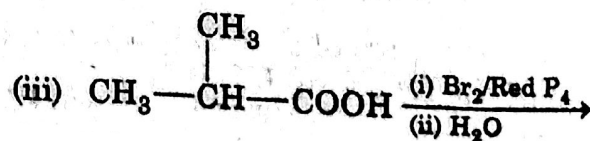
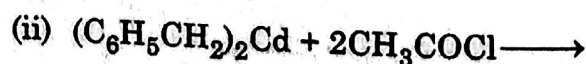
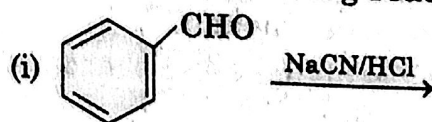
26. Describe how the following conversions can be brought about?

(i) Cyclohexanol to cyclohexan-1-one.

(ii) Ethyl benzene to benzoic acid.

(iii) Bromobenzene to benzoic acid.

27. Complete the following reactions



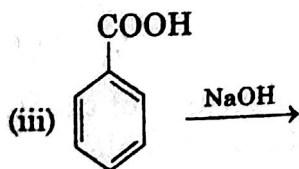
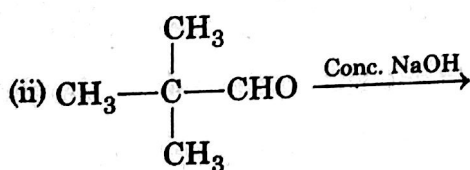
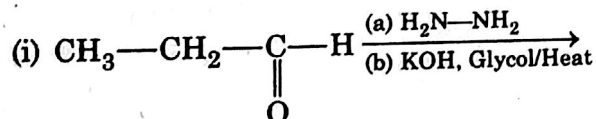
28. Write chemical equations for the following reactions

- (i) Propanone is treated with dilute $\text{Ba}(\text{OH})_2$
- (ii) Acetophenone is treated with $\text{Zn}(\text{Hg})/\text{Conc. HCl}$
- (iii) Benzoyl chloride is hydrogenated in presence of Pd/BaSO_4 .

5 Marks Questions

29. (a) Carry out the following conversions :
- (i) *p*-nitrotoluene to 2-bromobenzoic acid
 - (ii) Propanoic acid to acetic acid
- (b) An alkene with molecular formula C_5H_{10} on ozonolysis gives a mixture of two compounds, *B* and *C*. Compound *B* gives positive Fehling test and also reacts with iodine and NaOH solution. Compound *C* does not give Fehling solution test but forms iodoform. Identify the compounds *A*, *B* and *C*.

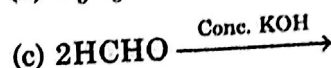
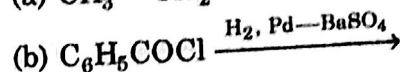
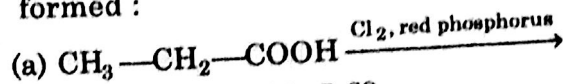
30. (a) Carry out the following conversions :
- (i) Benzoic acid to aniline
 - (ii) Bromomethane to ethanol
- (b) Write the structure of major product(s) in the following :



31. (i) Give reasons :
- (a) HCHO is more reactive than CH_3-CHO towards addition of HCN .
 - (b) $\text{p}K_a$ of $\text{O}_2\text{N}-\text{CH}_2-\text{COOH}$ is lower than that of CH_3-COOH .
 - (c) Alpha hydrogen of aldehydes and ketones is acidic in nature.

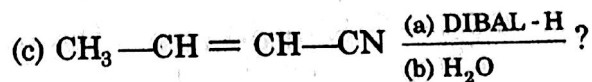
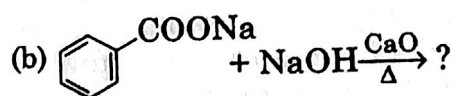
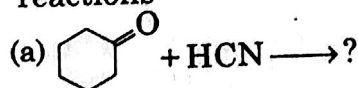
- (ii) Give simple chemical tests to distinguish between the following pairs of compounds :
 - (a) Ethanal and propanal
 - (b) Pentan-2-one and pentan-3-one

32. (i) Write structure of the product(s) formed :



- (ii) How will you bring the following conversions in not more than two steps :
- (a) Propanone to propene
 - (b) Benzyl chloride to phenyl ethanoic acid

33. (i) Write the product(s) in the following reactions



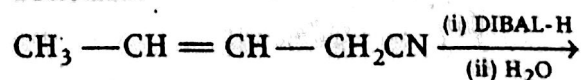
- (ii) Give simple chemical tests to distinguish between the following pairs of compounds :
- (a) Butanal and butan-2-one
 - (b) Benzoic acid and phenol

34. (i) Write the chemical equations for the reaction involved in Cannizzaro reaction.

- (ii) Draw the structure of semicarbazone of ethanol.

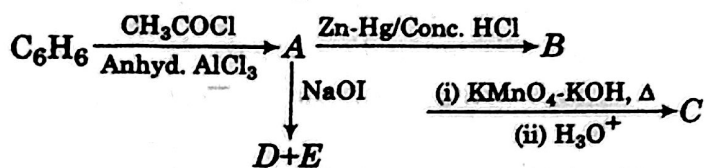
- (iii) Why $\text{p}K_a$ of $\text{F}-\text{CH}_2-\text{COOH}$ is lower than that of $\text{Cl}-\text{CH}_2-\text{COOH}$?

- (iv) Write the product in the following reaction

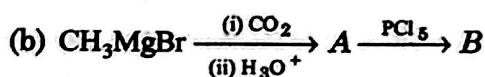


- (v) How can you distinguish between propanal and propanone?

35. Write the structures of A, B, C, D and E in the following reactions.



36. (i) Write the structures of A and B in the following reactions:



(ii) Distinguish between

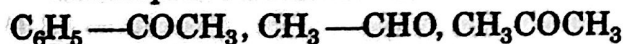


(iii) Arrange the following in increasing order of their boiling points.



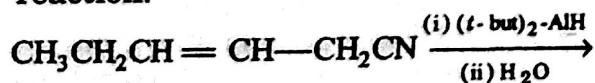
37. (i) Write the chemical reaction involved in Wolff-Kishner reduction.

(ii) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction.



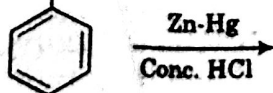
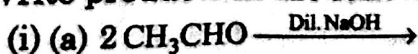
(iii) Why carboxylic acid does not give reactions of carbonyl group?

(iv) Write the product in the following reaction:



(v) A and B are two functional isomers of compound $\text{C}_3\text{H}_6\text{O}$. On heating with NaOH and I_2 , isomer B forms yellow precipitate of iodoform whereas isomer A does not form any precipitate. Write the formula of A and B.

38. Write products in the following



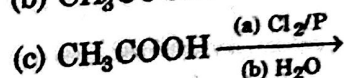
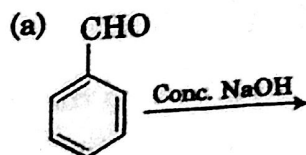
(ii) Give simple test to distinguish the following pairs of compounds.

(a) Ethanal and propanal.

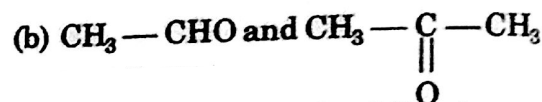
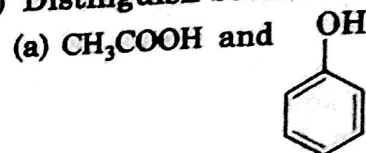
(b) Benzaldehyde and acetophenone.

(c) Benzoic acid and ethyl benzoate.

39. (i) Complete the following equations.



(ii) Distinguish between

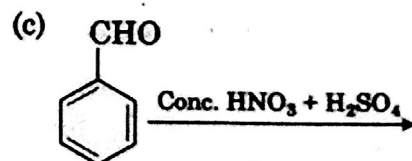
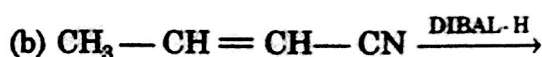
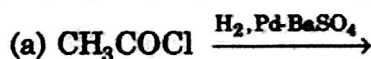


40. (i) What is meant by the following terms? Give example of the reaction in each case.

(a) Aldol

(b) Semicarbazone

(ii) Complete the following:



41. (i) Draw the structures of the following:

(a) *p*-methylbenzaldehyde

(b) 4-methylpent-3-en-2-one

(ii) Give chemical tests to distinguish between the following pairs of compounds :

(a) Benzoic acid and ethyl benzoate

(b) Benzaldehyde and acetophenone

(c) Phenol and benzoic acid

42. (i) Describe the following by giving chemical equations:

- (a) Decarboxylation reaction
(b) Friedel-Crafts reaction

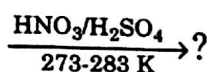
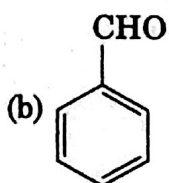
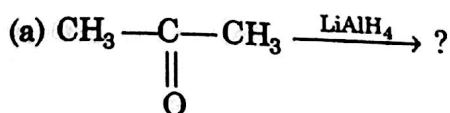
(ii) How will you bring about the following conversions?

- (a) Benzoic acid to benzaldehyde
(b) Benzene to *m*-nitroacetophenone
(c) Ethanol to 3-hydroxybutanal

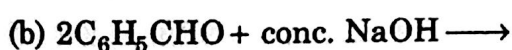
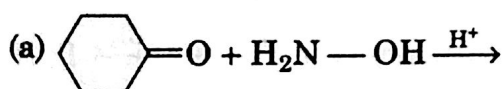
43. (i) Describe the following reactions.

- (a) Acetylation (b) Aldol condensation

(ii) Write the main product in the following equations:



44. (i) Write the products of the following reactions:



(ii) Give simple chemical tests to distinguish between the following pairs of compounds:

- (a) Benzaldehyde and benzoic acid
(b) Propanal and propanone

45. (i) Account for the following:

(a) CH_3CHO is more reactive than CH_3COCH_3 towards reaction with HCN

(b) Carboxylic acid is a stronger acid than phenol

(ii) Write the chemical equations to illustrate the following name reactions:

- (a) Wolff-Kishner reduction
(b) Aldol condensation
(c) Cannizzaro reaction

46. (i) Write the products formed when CH_3CHO reacts with the following reagents:

- (a) HCN (b) $\text{H}_2\text{N}-\text{OH}$
(c) CH_3CHO in the presence of dilute NaOH

(ii) Give simple chemical tests to distinguish between the following pairs of compounds:

- (a) Benzoic acid and phenol
(b) Propanal and propanone

47. (i) Account for the following:

- (a) $\text{Cl}-\text{CH}_2\text{COOH}$ is a stronger acid than CH_3COOH .
(b) Carboxylic acids do not give reactions of carbonyl group

(ii) Write the chemical equations to illustrate the following name reactions.

- (a) Rosenmund reduction
(b) Cannizzaro's reaction

(iii) Out of $\text{CH}_3\text{CH}_2-\text{CO}-\text{CH}_2-\text{CH}_3$ and $\text{CH}_3\text{CH}_2-\text{CH}_2-\text{CO}-\text{CH}_3$, which gives iodoform test?

48. (i) Account for the following:

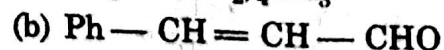
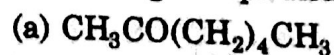
(a) CH_3CHO is more reactive than CH_3COCH_3 towards reaction with HCN .

(b) There are two $-\text{NH}_2$ groups in semicarbazide ($\text{H}_2\text{NNHCONH}_2$). However, only one is involved in the formation of semicarbazone.

(ii) Write the chemical equation to illustrate each of the following name reactions:

- (a) Rosenmund reduction
(b) Hell-Volhard-Zelinsky reaction
(c) Cannizzaro reaction

49. (i) Write the IUPAC names of the following compounds:



(ii) Describe the following conversions in not more than two steps :

- (a) Ethanol to 3-hydroxybutanal
 (b) Benzoic acid to *m*-nitrobenzyl alcohol
 (c) Propanone to propene

50. (i) Draw the structures of the following compounds :

- (a) 4-chloropentan-2-one
 (b) *p*-nitropropiophenone

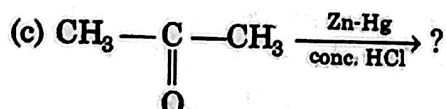
(ii) Give tests to distinguish between the following pairs of compounds :

- (a) Ethanal and propanal
 (b) Phenol and benzoic acid
 (c) Benzaldehyde and acetophenone

51. (i) Draw the structures of the following compounds :

- (a) 4-chloropentan-2-one
 (b) But-2-en-1-al

(ii) Write the product(s) in the following :



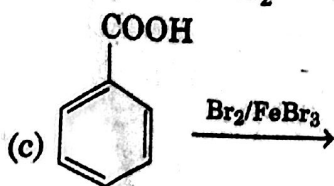
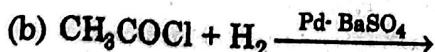
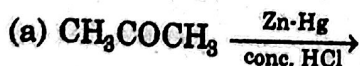
52. (i) How will you convert the following:

- (a) Propanone to propan-2-ol?
 (b) Ethanal to 2-hydroxypropanoic acid?
 (c) Toluene to benzoic acid?

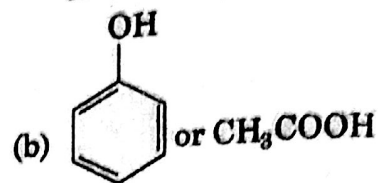
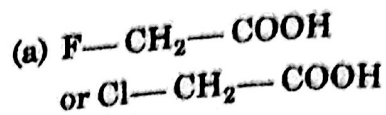
(ii) Give simple chemical tests to distinguish between

- (a) pentan-2-one and pentan-3-one
 (b) ethanal and propanal

53. (i) Predict the products



(ii) Which acid of each pair shown here would you expect to be stronger acid?



54. (i) Give chemical tests to distinguish between

- (a) propanal and propanone
 (b) benzaldehyde and acetophenone

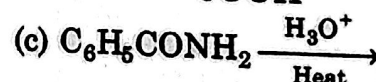
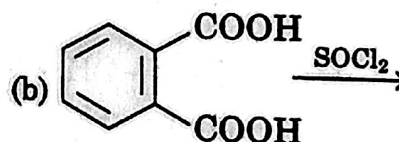
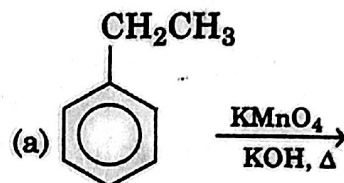
(ii) How would you obtain

- (a) butanoic acid from butanol?
 (b) benzoic acid from ethyl benzene?

55. (i) Describe the following giving linked chemical equations :

- (a) Cannizzaro reaction
 (b) Decarboxylation

(ii) Complete the following chemical equations :



56. (i) Illustrate the following name reaction.

Cannizzaro's reaction

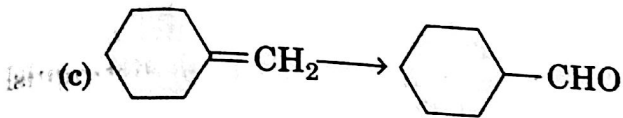
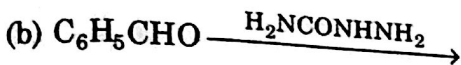
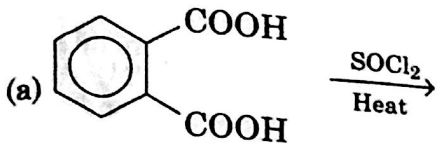
(ii) How would you obtain

- (a) butanoic acid from butanol?
 (b) benzoic acid from ethyl benzene?

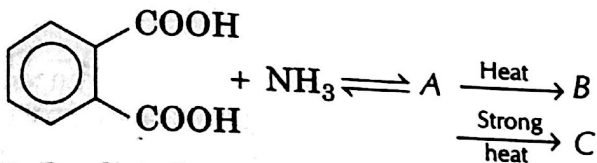
57. (i) Give chemical tests to distinguish between the following :

- (a) Benzoic acid and ethyl benzoate
 (b) Benzaldehyde and acetophenone

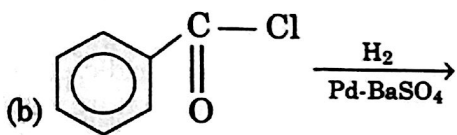
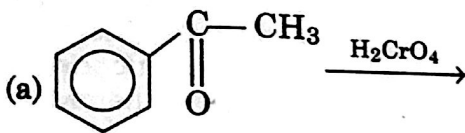
(ii) Complete the following :



58. (i) Identify *A*, *B* and *C* in the sequence



(ii) Predict the products of the following reactions :



59. (i) Illustrate the following name reactions :

Hell-Volhard-Zelinsky reaction

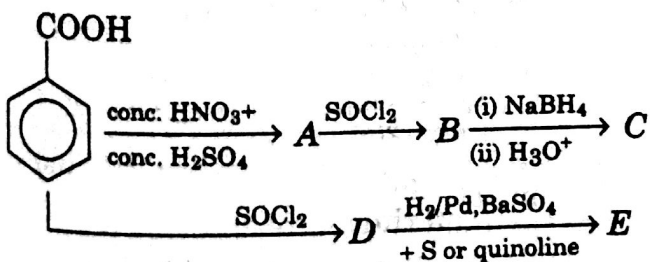
(ii) How are the following conversions carried out?

(a) Ethyl cyanide to ethanoic acid

(b) Butan-1-ol to butanoic acid

(c) Methyl benzene to benzoic acid

60. Identify *A* to *E* in the following reaction :



61. An organic compound *A* on treatment with ethyl alcohol gives a carboxylic acid *B* and compound *C*. Hydrolysis of *C* under acidified conditions gives *B* and *D*. Oxidation of *D* with KMnO_4 also gives *B*. *B* on heating with Ca(OH)_2 gives *E* having molecular formula $\text{C}_3\text{H}_6\text{O}$. *E* does not give Tollen's test and does not reduce Fehling's solution but forms a 2,4-dinitrophenylhydrazone. Identify *A*, *B*, *C*, *D* and *E*.