

# 11

## ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

### PREVIOUS YEARS' QUESTIONS

2019

#### Very Short Answer Type Questions [1 Mark]

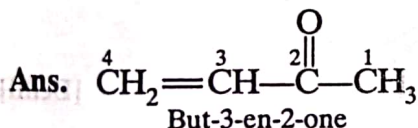
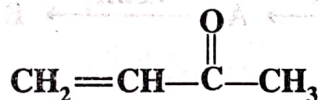
1.  $\text{CH}_3\text{CHO}$  is more reactive than  $\text{CH}_3\text{COCH}_3$  towards reaction with  $\text{HCN}$ . Why?

[AI Chandigarh]

Ans. It is because  $\text{CH}_3\text{CHO}$  is more polar and it has less steric hinderance than  $\text{CH}_3\text{COCH}_3$ .

2. Write the IUPAC name of the following compound:

[AI Chennai, Panchkula]



3. *p*-Nitrobenzoic acid has lower *pK<sub>a</sub>* value than benzoic acid, why?

[AI Chandigarh]

Ans. It is because  $-\text{NO}_2$  group is electron withdrawing, therefore, *p*-nitrobenzoate ion is more stable than benzoate ion, *p*-nitro benzoic acid is more acidic and has lower *pK<sub>a</sub>*.

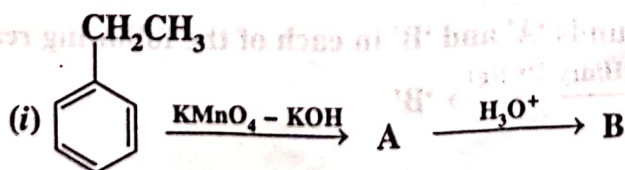
4. Why is oxidation of  $\text{CH}_3\text{CHO}$  easier than  $\text{CH}_3\text{COCH}_3$ ?

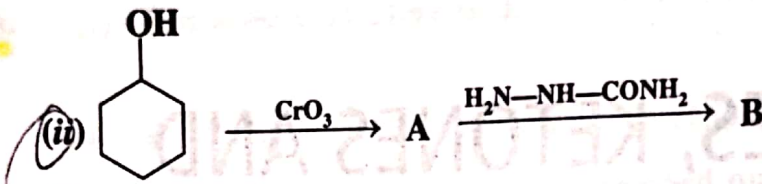
[AI Chandigarh]

Ans. It is because  $\text{CH}_3\text{CHO}$  are strong reducing agent than  $\text{CH}_3\text{COCH}_3$  and bond breaks easily in  $\text{CH}_3\text{CHO}$ .

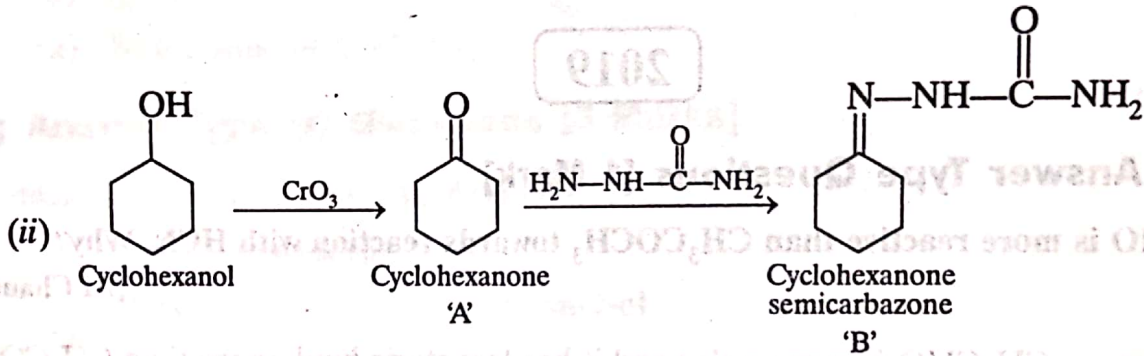
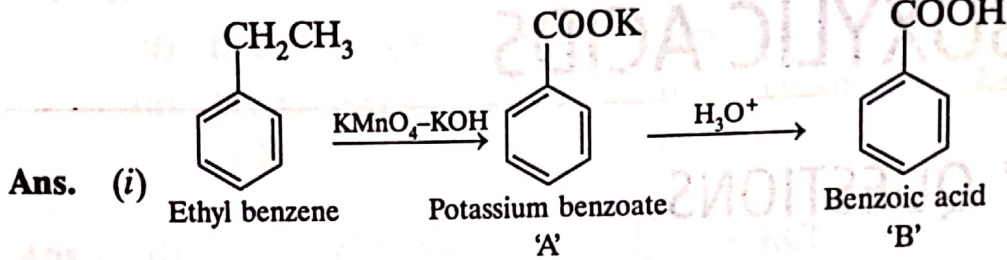
#### Short Answer Type Questions [2 Marks]

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

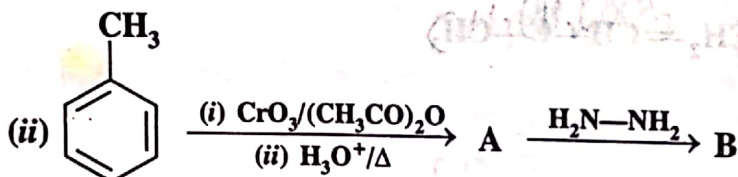
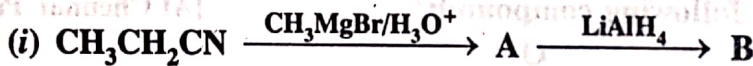




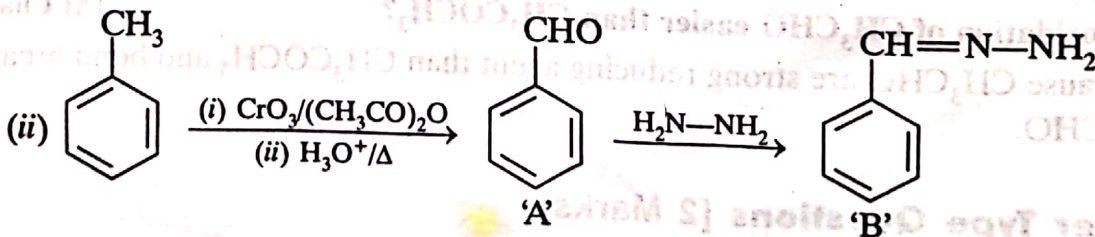
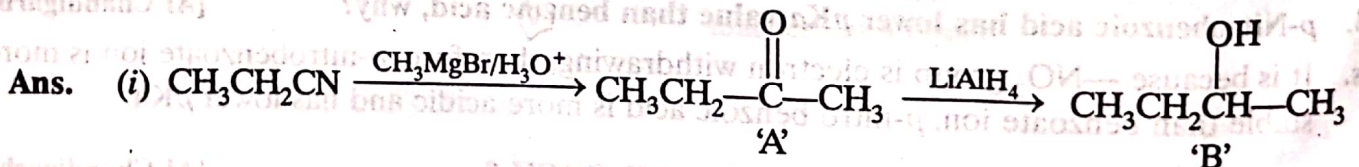
[Delhi]



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

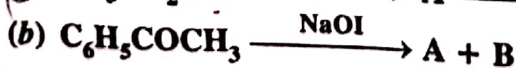
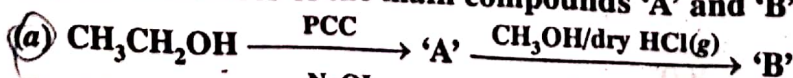


[Delhi]



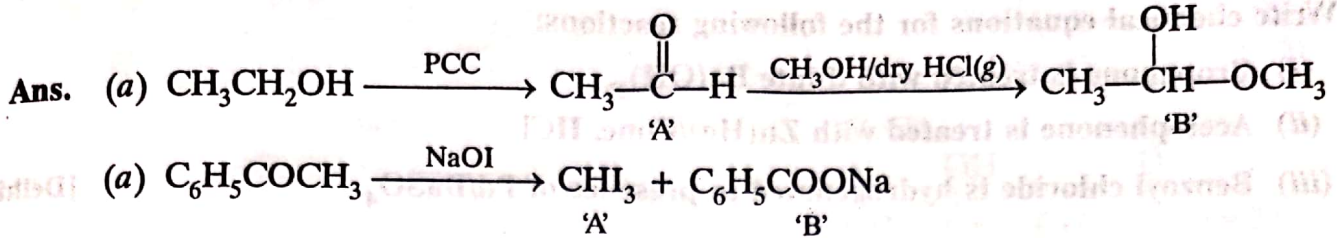
Long Answer Type [I] Questions [3 Marks]

7. Write the structures of the main compounds 'A' and 'B' in each of the following reactions:

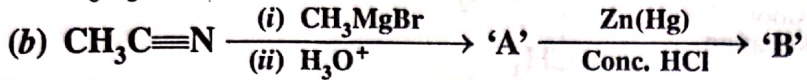
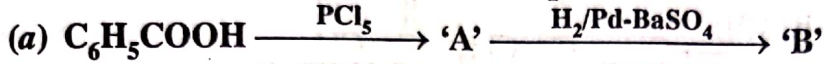


[CBSE]

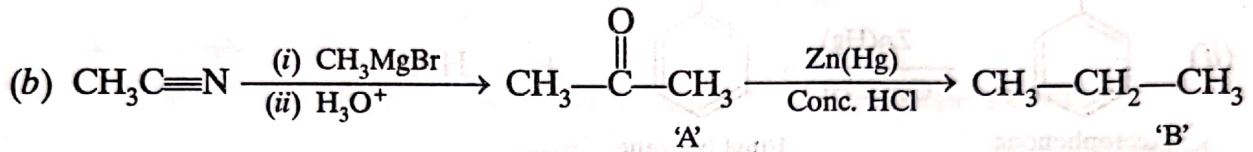
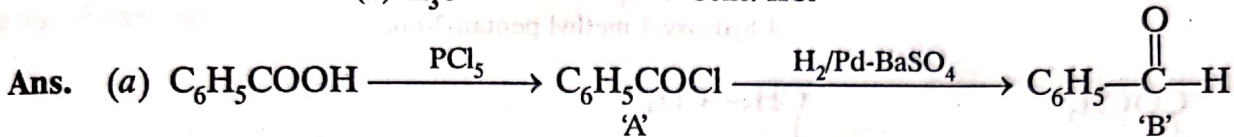




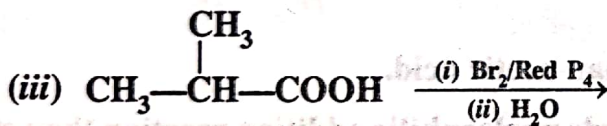
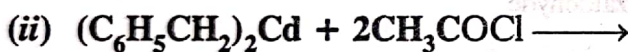
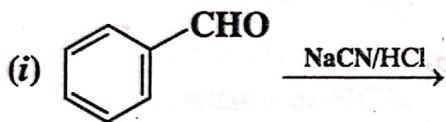
8. Write the structures of the main compounds 'A' and 'B' in each of the following reactions:



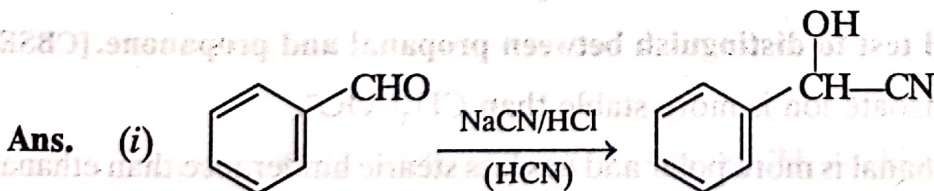
[CBSE]



9. Complete the following reactions:



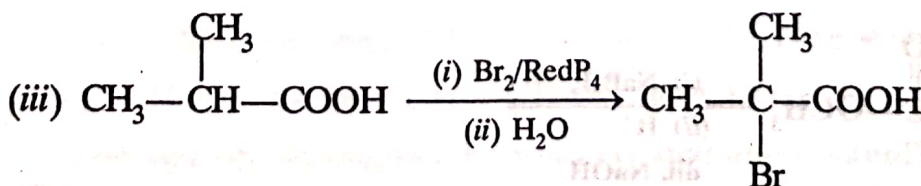
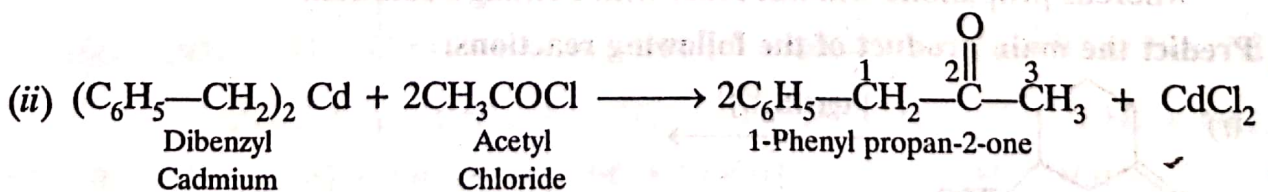
[Delhi]



Benzaldehyde

Benzaldehyde cyanohydrin

(2-hydroxy-2-phenyl ethane nitrile)

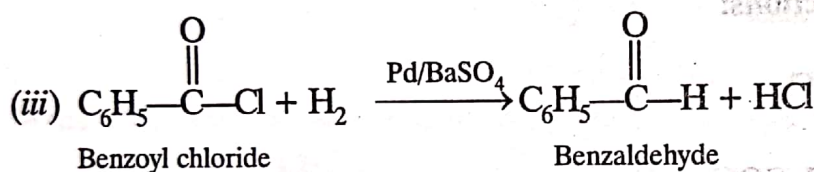
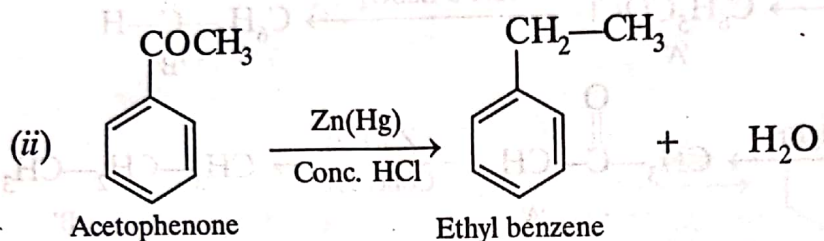
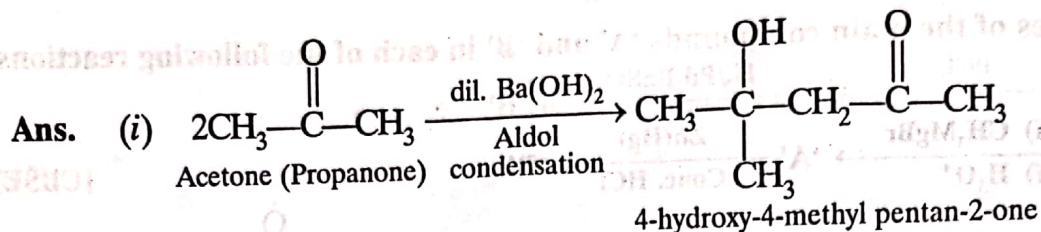


2-Bromo-2-methyl propanoic acid

10. 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  $\text{Pd}/\text{BaSO}_4$ .

[Delhi]



11. (a) Give reasons:

(i) Benzoic acid is stronger acid than acetic acid.

(ii) Methanal is more reactive towards nucleophilic addition reaction than ethanal.

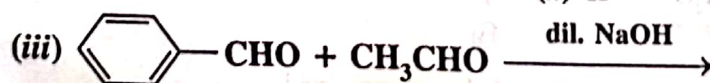
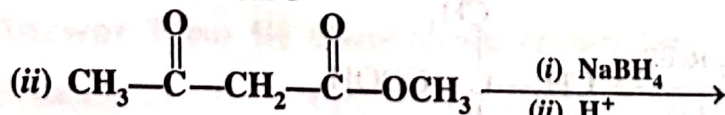
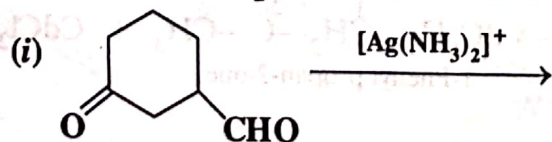
(b) Give a simple chemical test to distinguish between propanal and propanone. [CBSE]

Ans. (a) (i) It is because benzoate ion is more stable than  $\text{CH}_3\text{COO}^-$ .

(ii) It is because methanal is more polar and has less steric hinderance than ethanal.

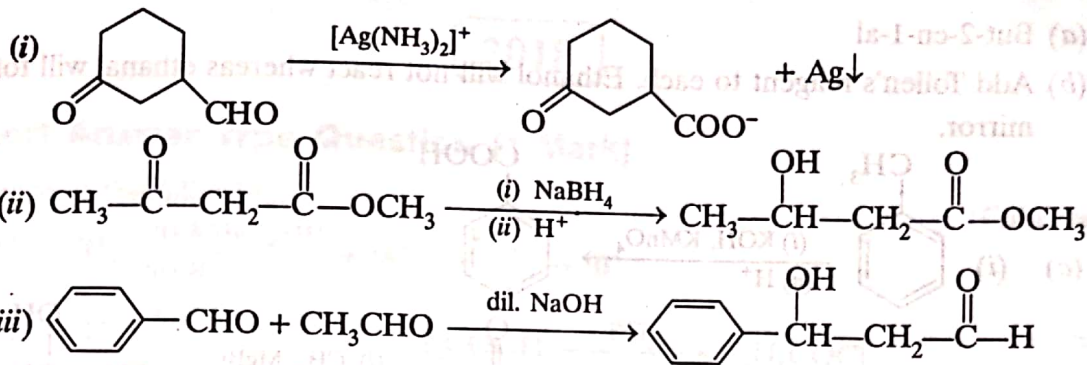
(b) Add Fehling's solution to each of them and heat. Propanal will give brick red ppt. whereas propanone will not react with Fehling's solution.

12. Predict the main product of the following reactions:



[AI Panchkula]





### Long Answer Type [II] Questions [5 Marks]

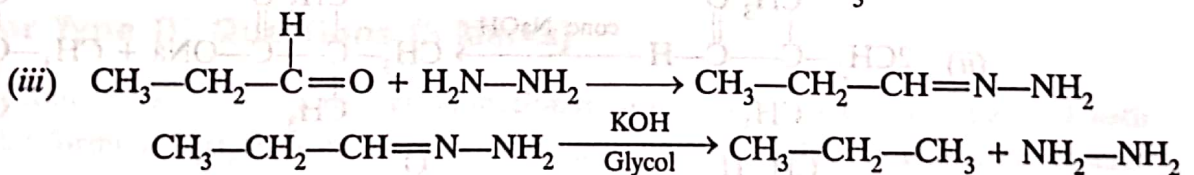
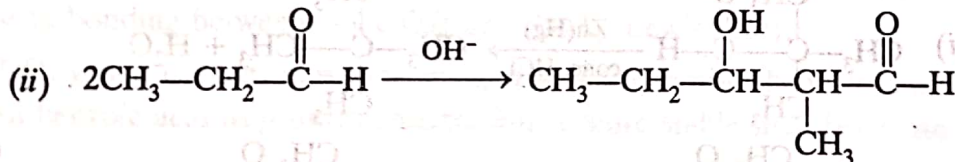
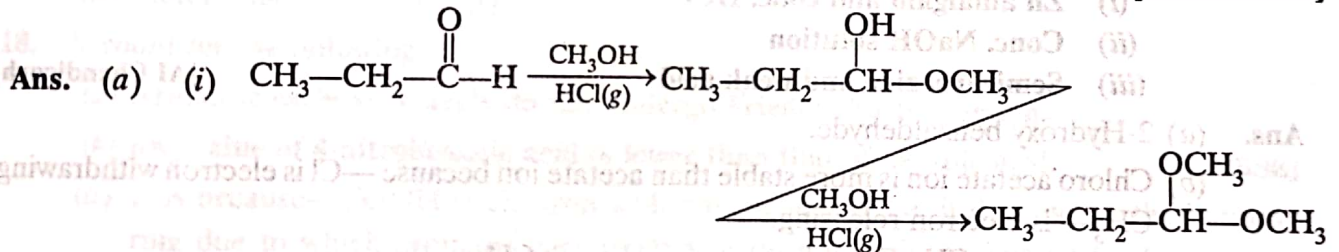
13. (a) What is main product form when propanal reacts with the following reagents:

- 2 moles of  $\text{CH}_3\text{OH}$  in presence of dry  $\text{HCl}(g)$
- Dilute  $\text{NaOH}$
- $\text{NH}_2\text{—NH}_2$  followed by heating with  $\text{KOH}$  in ethylene glycol.

(b) Arrange the following compounds in increasing order of property indicated:

- $\text{FCH}_2\text{COOH}$ ,  $\text{O}_2\text{N—CH}_2\text{—COOH}$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{HCOOH}$ — acid character.
- Acetone, Acetaldehyde, Benzaldehyde, Acetophenone— reactivity towards addition of  $\text{HCN}$ .

[AI Panchkula]



(b) (i)  $\text{CH}_3\text{COOH} < \text{HCOOH} < \text{FCH}_2\text{COOH} < \text{O}_2\text{N—CH}_2\text{COOH}$

(ii) Acetophenone < Benzaldehyde < Acetone < Acetaldehyde.

14. (a) Give IUPAC name of  $\text{CH}_3\text{—CH=CH—CHO}$ .

(b) How can you distinguish between ethanal and ethanol?

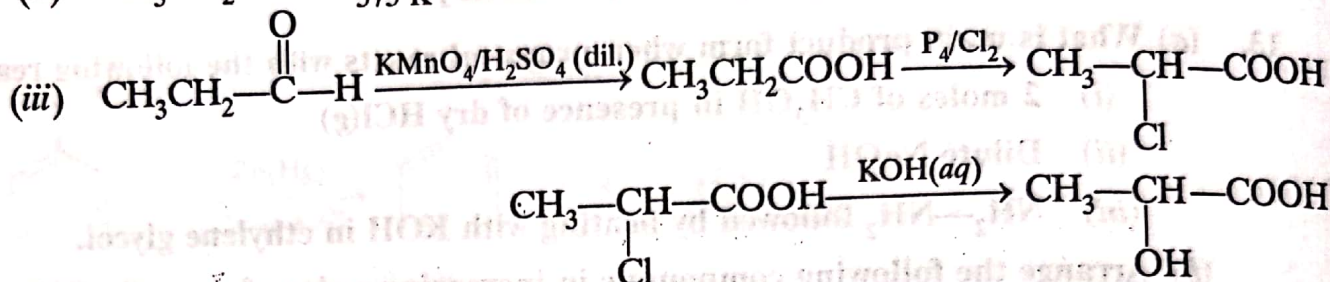
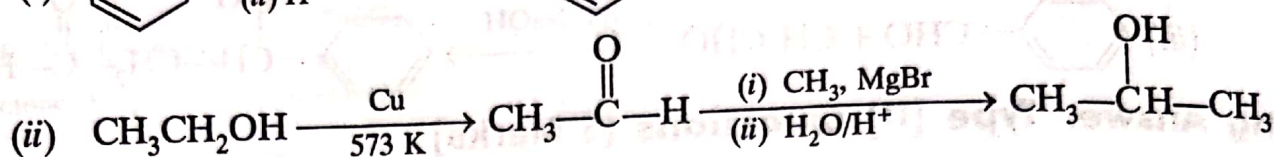
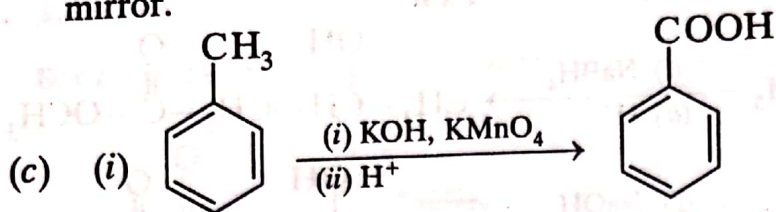
(c) How will you convert the following:

- Toluene to Benzoic acid
- Ethanol to propan-2-ol
- Propanal to 2-hydroxy propanoic acid

[AI Chandigarh]

Ans. (a) But-2-en-1-al

(b) Add Tollen's reagent to each. Ethanol will not react whereas ethanal will form silver mirror.



15. (a) Give IUPAC name of salicylaldehyde.

(b) Chloro acetic acid is more acidic than acetic acid.

(c) Write the product formed when  $(\text{CH}_3)_3\text{CCHO}$  reacts with the following:

(i) Zn amalgam and conc. HCl

(ii) Conc. NaOH solution

(iii) Semicarbazide and weak acid

[AI Chandigarh]

Ans. (a) 2-Hydroxy benzaldehyde.

(b) Chloro acetate ion is more stable than acetate ion because  $-\text{Cl}$  is electron withdrawing,  $\text{CH}_3-$  is electron releasing.

