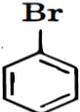


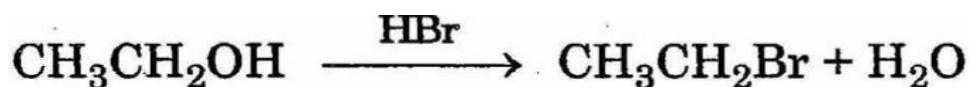


ARMY PUBLIC SCHOOL RATNUCHAK
SESSION 2019-20
WORKSHEET

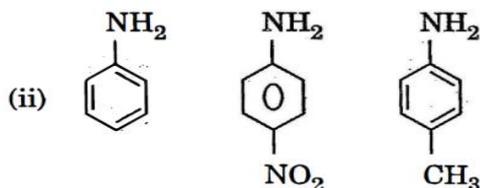
CLASS: XII

SUB: SCIENCE

1. Write the products formed . when CH_3CHO reacts with the following reagents
(i) HCN (ii) $\text{H}_2\text{N} - \text{OH}$ (iii) CH_3CHO in_ the presence of dilute Na OH
2. Give simple chemical tests to distinguish between the following pairs of compounds:
(i) Benzoic acid and Phenol
(ii) Propanal and Propanone
3. Account for the following :
(i) $\text{Cl} - \text{CH}_2\text{COOH}$ is a stronger acid than CH_3COOH .
(ii) Carboxylic acids do not give reactions of carbonyl group.
4. Write the major product in the following cases:
(i) $\text{CH}_3 - \text{CH} = \underset{\text{CH}_3}{\text{C}} - \text{CH}_3 + \text{HBr} \longrightarrow$
(ii) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\text{Br}}{\text{CH}} - \text{CH}_3 + \text{KOH} \xrightarrow{\text{ethanol/heat}}$
(iii)  + $\text{CH}_3\text{Cl} \xrightarrow{\text{anhyd. AlCl}_3}$
5. Write the chemical equation to illustrate the following named reactions:
(i) Rosenmund reduction
(ii) Cannizzaro' s reaction
6. Out of $\text{CH}_3\text{CH}_2\text{-CO-CH}_2\text{-CH}_3$ and $\text{CH}_3\text{CH}_2 \text{ CH}_2\text{COCH}_3$, which gives iodoform test ?
7. Write the mechanism of the following reaction :



8. Arrange the following in increasing order of their basic strength:



9. How do you convert the following:

- $C_6H_5CONH_2$ to $C_6H_5NH_2$
- Aniline to phenol
- Ethanenitrile to ethanamine

10. Write the chemical equations involved when aniline is treated with the following reagents.

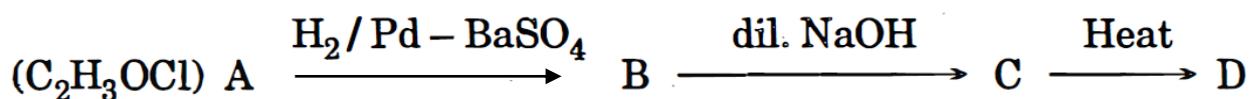
- Br_2 water
- $CHCl_3 + KOH$
- HCl

11. Give reasons for the following:

- Phenol is more acidic than ethanol.
- Boiling point of ethanol is higher than methoxymethane.
- $(CH_3)_3C-O-CH_3$ on reaction with HI comparison to CH_3OH and $(CH_3)_3C-I$ as the main products and not $(CH_3)_3C-OH$ and CH_3I .

12. A compound 'N' of molecular formula C_2H_3OCl undergoes a series of reactions as shown

below. Write the structures of A, B, C and D in the following reactions:-



13. Distinguish between the following:

- $C_6H_5 - COCH_3$ and $C_6H_5 - CHO$
- Benzoic acid and diethyl benzoate

- (iii) $\text{CH}_3\text{CH}_2\text{CHO}$ and $\text{CH}_3\text{CH}_2\text{COCH}_3$
- (iv) $\text{C}_6\text{H}_5\text{COCH}_3$ and $\text{C}_6\text{H}_5\text{CHO}$
- (v) CH_3COOH and HCOOH
- (vi) Ethanal and Propanal
- (vii) Aniline and Benzylamine.
- (viii) Methylamine and Dimethylamine.

14. $(\text{CH}_3\text{COCH}_3)$ reacts with the following reagents :

- (i) $\text{Zn}/\text{Hg}/\text{conc. HCl}$
- (ii) $\text{H}_2\text{NNHCONH}_2$
- (iii) CH_3MgBr and then H_3O^+

15. Arrange the following in the increasing order of their boiling points:



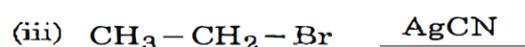
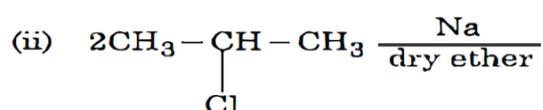
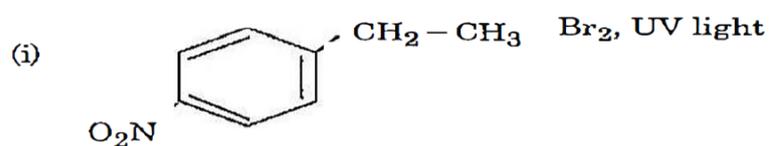
16. Give reasons for the following

- (i) Aniline does not undergo Friedal-Crafts reaction.
- (ii) $(\text{CH}_3)_2\text{NH}$ is more basic than $(\text{CH}_3)_3\text{N}$ in an aqueous solution.
- (iii) Primary amines have higher boiling point than tertiary amines.

17. How do you convert:

- (i) Chlorobenzene to biphenyl
- (ii) Propene to 1-iodopropane
- (iii) 2-bromobutane to but-2-ene

18. Write the major product(s) in the following



19. Write the equations involved in the following reactions :

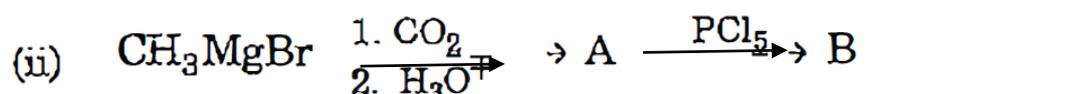
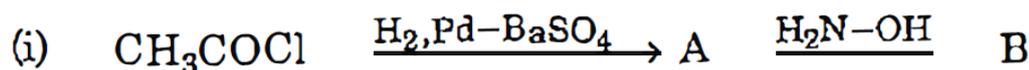
- (i) Wolff-Kishner reduction
- (ii) Etard reaction

20. Following compounds are given to you :

2-Bromopentane, 2-Bromo-2-methylbutane, 1-Bromopentane

- (i) Write the compound which is most reactive towards SN2 reaction.
- (ii) Write the compound which is optically active.
- (iii) Write the compound which is most reactive towards a-elimination reaction.

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



22. I) Arrange the following in the increasing order of their boiling points:

CH_3CHO , CH_3COOH , $\text{CH}_3\text{CH}_2\text{OH}$

II) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction $\text{C}_6\text{H}_5\text{COCH}_3$, $\text{CH}_3\text{-CHO}$, CH_3COCl

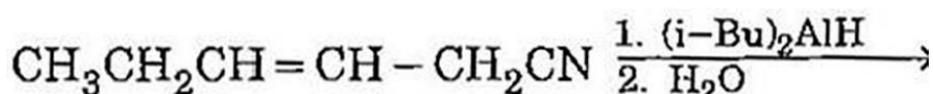
23. Convert:

- (i) Benzoic acid to benzaldehyde
- (ii) Ethyl benzene to Benzoic acid
- (iii) Propanone to Propene
- (iv) Ethanoic acid into methanamine.
- (v) Aniline to p-Bromoaniline.

24. Give reasons :

- (i) Acetylation of aniline reduces its activation effect.
- (ii) CH_3NH_2 is more basic than $\text{C}_6\text{H}_5\text{NH}_2$.
- (iii) Although $-\text{NH}_2$ is o/p directing group, yet aniline on nitration gives a significant amount of m-nitroaniline.
- (iv) Why carboxylic acid does not give reactions of carbonyl group ?

25. Write the product in the following reaction



26.(e) A and B are two functional isomers of compound C₃H₆O. On heating with NaOH and isomer B forms yellow precipitate of iodoform whereas isomer A does not form any precipitate. Write the formulae of A and B. Justify your answer in both cases.

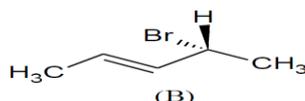
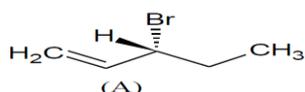
27. a) Give a plausible explanation for each one of the following:

- Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol.
- There are two -NH₂ groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

28. Carry out the following conversions in not more than two steps:

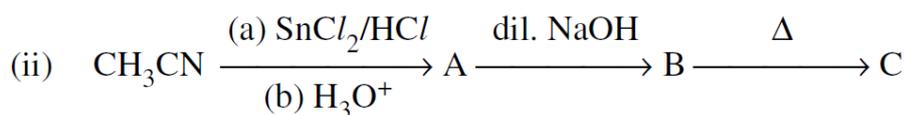
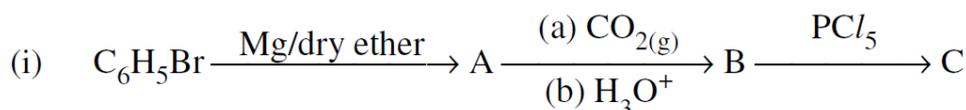
- Phenyl magnesium bromide to benzoic acid.
- Acetaldehyde to But-2-enal.
- Benzene to m-Nitroacetophenone

29. Identify the compound that on hydrogenation produces an optically active compound from the following compounds:



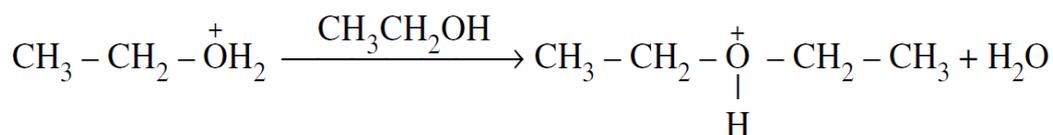
30.

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



31.

Write the mechanism (using curved arrow notation) of the following reaction :



32. a) A ketone A which undergoes haloform reaction gives compound B on reduction. B on heating with sulphuric acid gives compound C, which forms mono-ozonide D. The compound D on hydrolysis in presence of zinc dust gives only

acetaldehyde. Write the structures and IUPAC names of A, B and C. Write down the reactions involved.

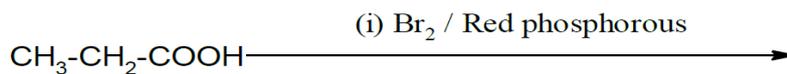
b) Predict the products formed when cyclohexanecarbaldehyde reacts with following reagents.

i. PhMgBr and then H_3O^+ .

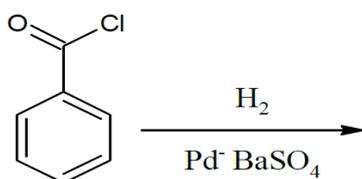
ii. Tollens' reagent.

33. Identify the reaction and write the IUPAC name of the product formed:

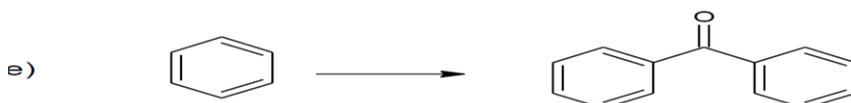
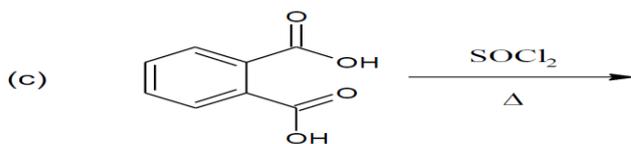
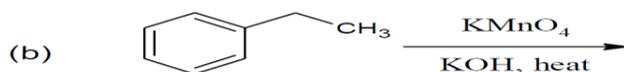
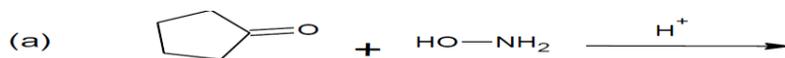
(a)



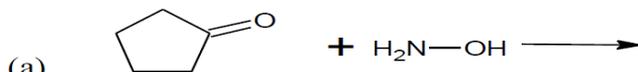
(b)



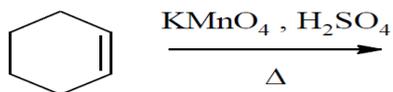
34. Complete each synthesis by giving missing starting material, reagent or products:



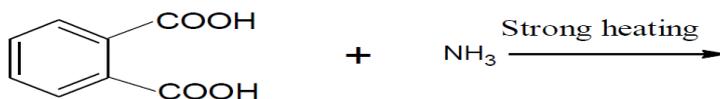
35. Complete the following reactions :



(b)



(c)



36. Account for the following:

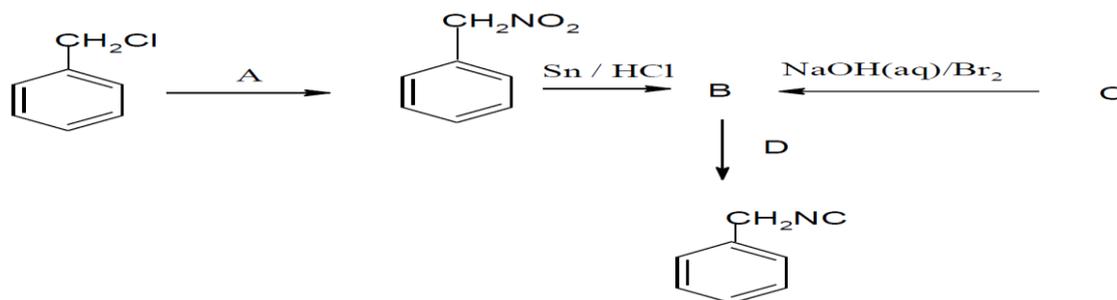
(i) Direct nitration of aniline yields significant amount of meta derivative.

(ii) Primary aromatic amines cannot be prepared by Gabriel phthalimide synthesis.

37. Arrange the following in increasing order of basic strength:

Aniline, p-nitroaniline and p-toluidine.

38. Identify A-D



(c) Complete the following:

