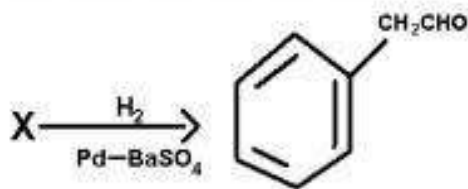


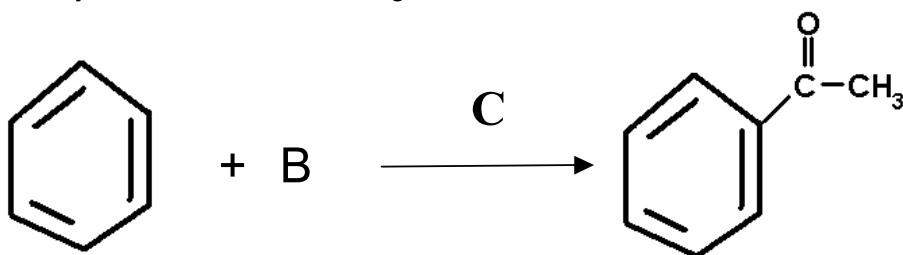
UNIT-12 ALDEHYDES KETONES AND CARBOXYLIC ACIDS

1-Mark Questions

1) Identify X.

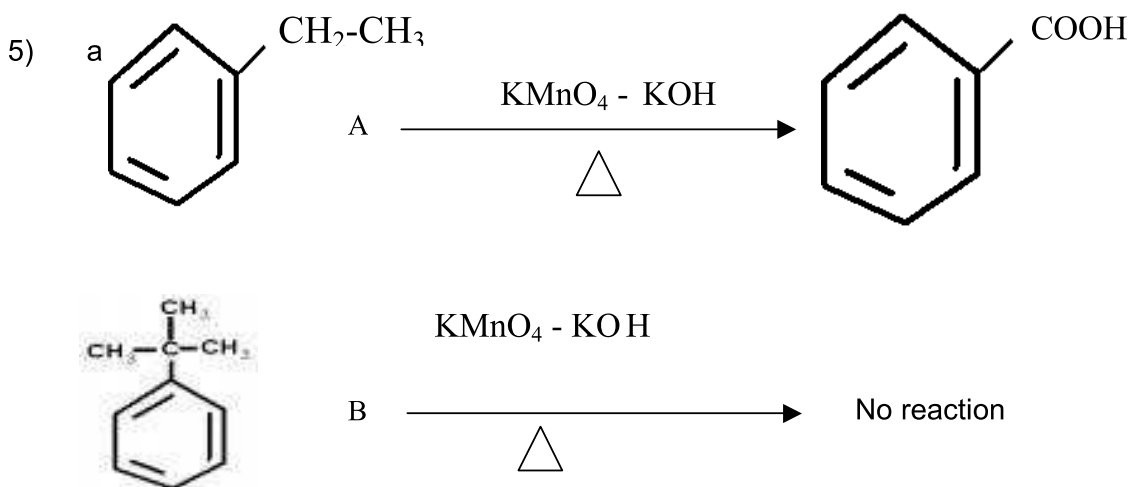


2) Identify B and C in the following reaction.



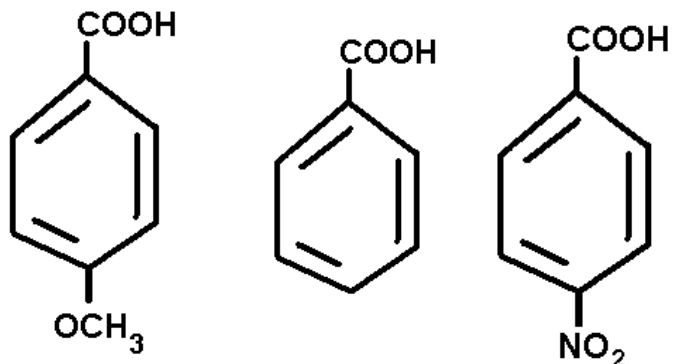
3) Arrange the following compounds in the increasing order of their boiling points.
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$, $\text{CH}_3\text{OCH}_2\text{CH}_3$, $\text{CH}_3\text{CH}_2\text{CHO}$, CH_3COCH_3 , $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

4) Propanal is more reactive than propanone. Give the reason.

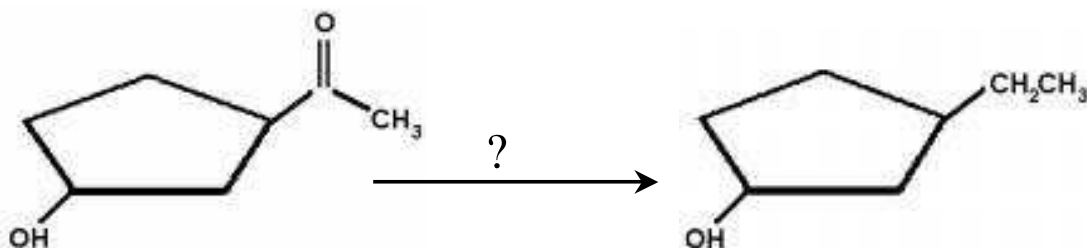


Observe the reactions and state why the compound A is oxidized whereas compound B is not oxidized by alkaline KMnO_4 ?

6) Which one among the following is the strongest acid?

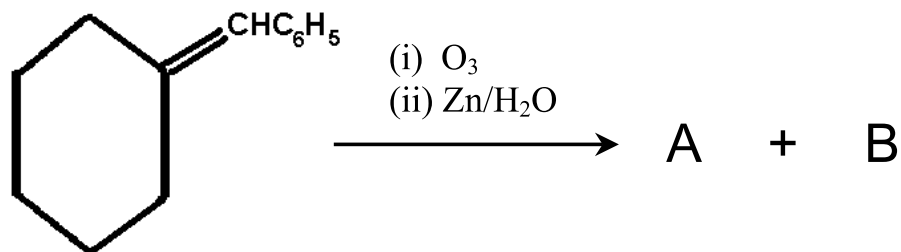


7) Identify the reagent used in the following conversion.



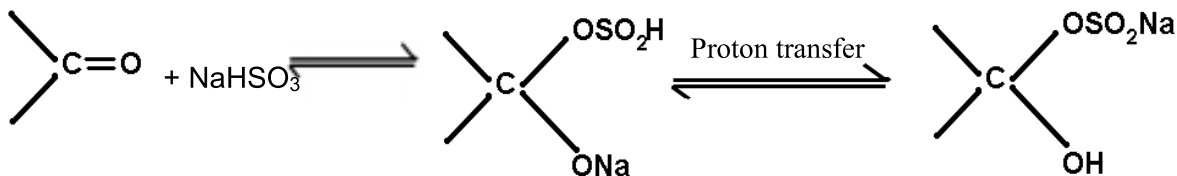
8) Fluorine is more electronegative than Chlorine even then P-Fluorobenzoic acid is weaker acid than P-Chlorobenzoic acid. State the plausible reason for this.

9) Identify A and B in the following reaction:



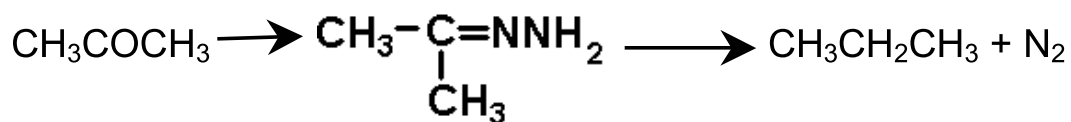
2- Mark Questions

10) For the reaction:



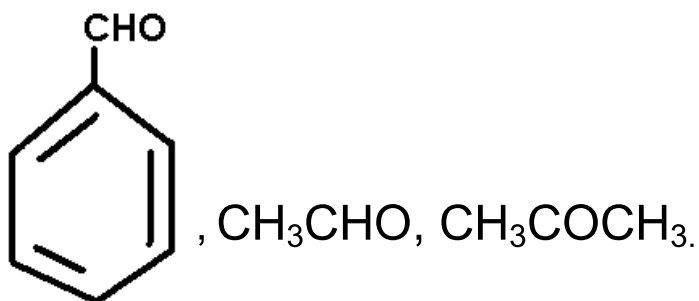
The position of equilibrium lies largely to the right hand side for most Aldehydes and to the left for most ketones. Find out the reason.

11) Identify the following named reactions and write the reagents used:

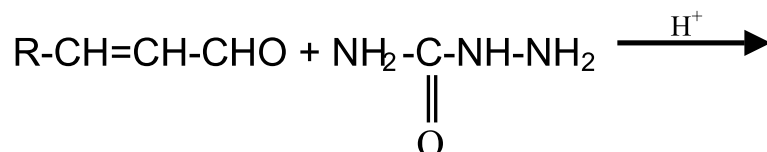
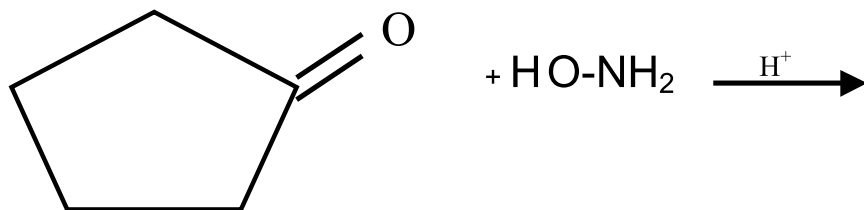


12) Aldol condensation of a ketone in presence of dilute alkali gives 4-Hydroxy -4-methylpentan-2-one. Write the structure of ketone and its IUPAC name.

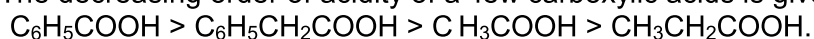
13) Which among the following compounds give Cannizzaro reaction and state the reason?



14) Predict the products of the following reactions:



15) The decreasing order of acidity of a few carboxylic acids is given below:



Explain plausible reason for the order of acidity followed.

16) An organic compound A, Molecular Formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2,4 DNP derivative, reduces Tollens reagent and undergoes Cannizzaro reaction. On vigorous oxidation it gives 1,2-benzenedicarboxylic acids. Identify A.

(Hint: An aldehyde which does not contain α hydrogen atom.)

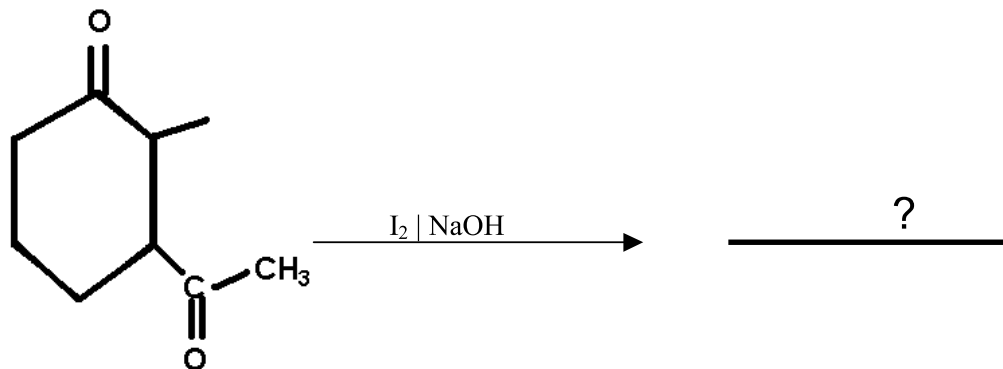
17) Do the following conversion using suitable reagents not more than two steps:

- Ethanol to 3-Hydroxybutanal.
- Bromobenzene to 1-phenylethanol.

18) Compound A $\text{C}_4\text{H}_8\text{Cl}_2$ is hydrolysed to a compound B $\text{C}_4\text{H}_8\text{O}$ which forms an oxime with NH_2OH and gives negative Tollens test. What are the structures of A and B. Write balanced chemical equations for the reactions involved.

(Hint: A is a gemdihalide and B is a ketone)

19) Write the structure of the product and name the reaction.



20) Give reasons for the following:

i) Iodoform is obtained when methyl ketones react with hypoiodite but not with iodide
(Hint: Hypoiodite ion being stronger base than iodide ion, can easily remove acidic hydrogen atom.)

ii) Hydrazones of aldehydes and ketones are not prepared in highly acidic medium.
(Hint: In strong acidic medium N of reagent gets protonated to get an electrophile which cannot react.)

21) Both $\text{C}=\text{C}$ and $\text{C}=\text{O}$ give addition reactions. How do the addition reactions differ in both the cases and explain why?

Hint: $\text{C}=\text{C}$ Formed between two similar atoms having same electronegativity.

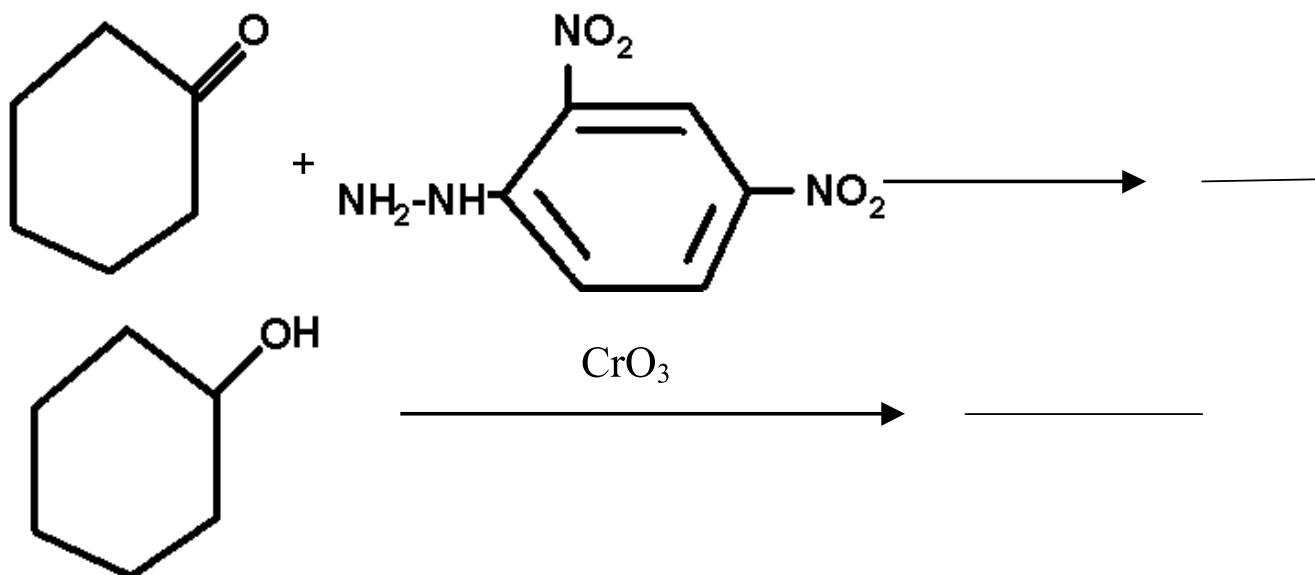
$\text{C}=\text{O}$ Formed between two different atoms with different electronegativities.

22) Benzaldehyde gives positive test with Tollens reagent but not with Fehlings solution. State the reason.

Hint: +R effect increases electron density on carbonyl group and C-H become strong.

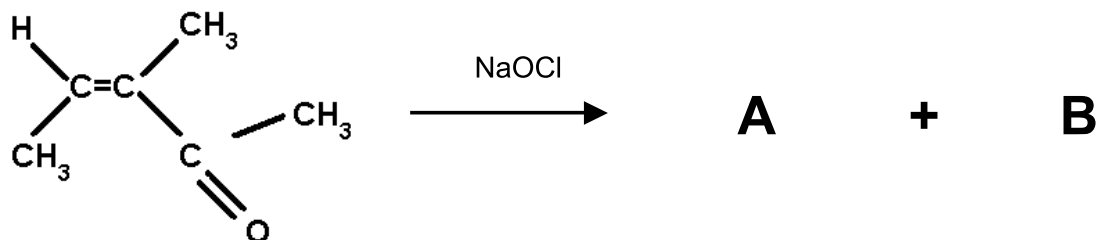
$\text{Ag}(\text{NH}_3)_2^+$ is a stronger oxidizing agent than Cu^{2+} + tartarate + base.

23) Write the structures of the products in the following reactions:



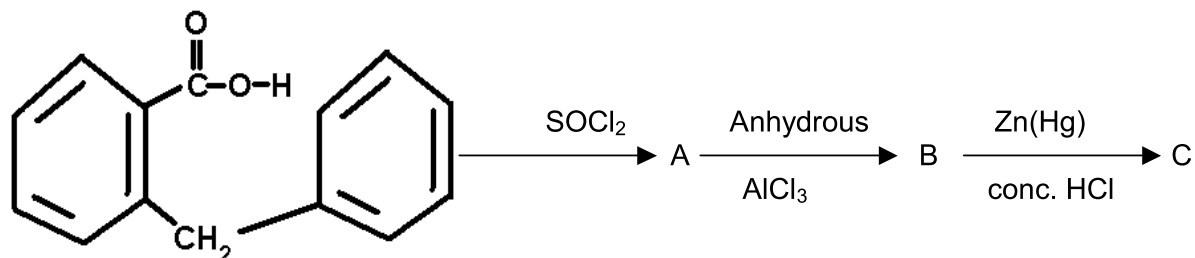
3-Mark Questions

24)



- Write the structures of A and B.
- Identify any two important features of this reaction.
(Hint: - Structural characteristics of compounds giving haloform reaction.)

25)



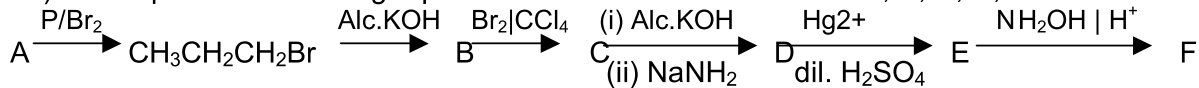
Write the structures of A, B and C.

- 26) Compound X, containing Chlorine on treatment with strong ammonia gives a solid Y which is free from Chlorine. Y on analysis gives C=49.31%, H=9.59% and N=19.18% and reacts with Br_2 and caustic soda to give a basic compound Z. Z reacts with HNO_2 to give ethanol. Suggest structures for X, Y and Z.

Hint:

Calculate the empirical formula of the compound. Y reacts with Br_2 and alkali indicates that it is amide.

- 27) Complete the following equation and write the structures of A, B, C, D, E and F.



- 28) A compound X (C_2H_4O) on oxidation gives Y ($C_2H_4O_2$). X undergoes haloform reaction. On treatment with HCN, X forms a product Z which on hydrolysis gives 2-hydroxy propanoic acid.
- Write down the structures of X and Y.
 - Name the product when X reacts with dil. NaOH.
 - Write down the equations for the reactions involved.

Hint: - X is an aldehyde since it has general formula $C_nH_{2n}O$ and has only two carbon atoms.

5- Mark Questions

- 29) An alkene (A with molecular formula C_7H_{14}) on ozonolysis yields an aldehyde. The aldehyde is easily oxidized to an acid (B). When B is treated with Bromine in presence of Phosphorous it yields a compound (C) which on hydrolysis gives a hydroxy acid (D). This acid can also be obtained from acetone by the reaction with hydrogen cyanide followed by hydrolysis. Identify A, B, C and D and write the chemical equations for the reactions involved.
- 30) Five isomeric para-di- substituted aromatic compounds, A to E with molecular formula $C_8H_8O_2$ were given for identification. Based on the following observations give the structures of the compounds:

Both A and B form silver mirror with Tollens reagent, also B gives a positive test with $FeCl_3$.

C gives positive Iodoform test.

D is readily extracted in aqueous $NaHCO_3$ solution.

E on acid hydrolysis gives 1,4-dihydroxy benzene.

Hint: A and B contain CHO groups since they've shown positive Tollens test. B has phenolic group as it reacts with $FeCl_3$ solution. C should have $-CH_3CO$ group. D should have $-COOH$ group. E should be p-hydroxy phenyl vinyl ether.