Daily Tutorial Sheet-1	JEE Main (Archive)

1.(C) $R-CHO$ → Tollen's Reagent → $RCOOH + Ag$; Fehling's Reagent → $RCOOH + Cu_2O$; Schiff's Reagent → Pink colouration; Grignard Reagent → Secondary alcohols

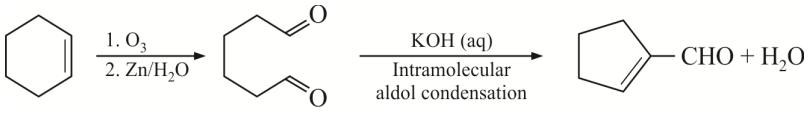
In this case ketone reacts only with Grignard reagent.

2.(B) H atom of active methylene group is most acidic. Here, methylene group is sandwitched between two EWGs.

3.(A) $PhCHO + HCHO + NaOH \rightarrow PhCH_2OH + HCOONa$

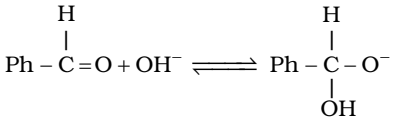
Cross Cannizzarro's reaction

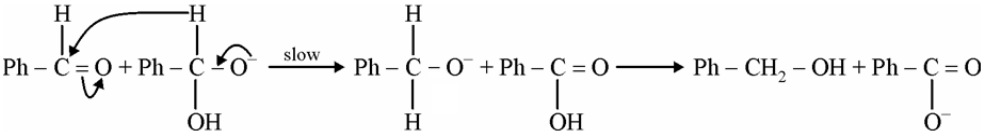
4.(C) Electron releasing group decreases electrophilicity of carbonyl carbon and it results in decreased reactivity towards a nucleophile.

5.(A) 

6.(B) The possible mechanism is :

The slowest step is the transfer of hydride to the carbonyl group as shown in step (ii).

(i) 

(ii) 

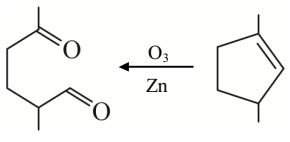
7.(A) Cannizzaro's reaction is given by aldehydes (RCHO) lacking H at α -carbon or lacking α -carbon (as in HCHO). With NaOH, there is formation of acid salt ($RCOO^-$) by oxidation and alcohol (RCH_2OH) by reduction.

$$2Cl_3C-CHO + NaOH \longrightarrow Cl_3C-COONa + Cl_3C-CH_2OH$$

Note : *Usually chloral gives chloroform by action of NaOH, but here as per question we have to visualise Cannizzaro reaction.*

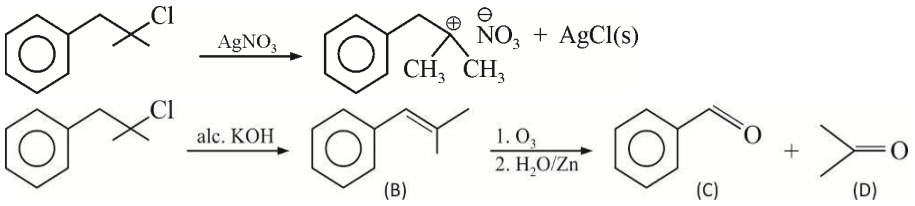
8.(D) $R-CH_2OH$ → $KMnO_4$ → $R-COOH$; $K_2Cr_2O_7$ or CrO_3 → $R-COOH$; PCC → $R-CHO$

9.(C) $CH_3CHO \xrightarrow[2.\ H_2O]{1.\ NaBH_4} CH_3CH_2OH \xrightarrow{PCl_5} CH_3CH_2Cl \xrightarrow{alc\,KOH} CH_2=CH_2$

10.(B) 

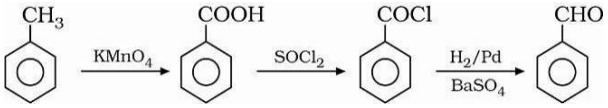
5-keto-2-methylhexanal

11.(A)

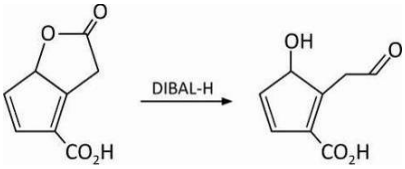


12.(B) $2\,CH_3CHO \xrightarrow[\Delta]{HO^-} CH_3 - CH = CH - CHO + H_2O$

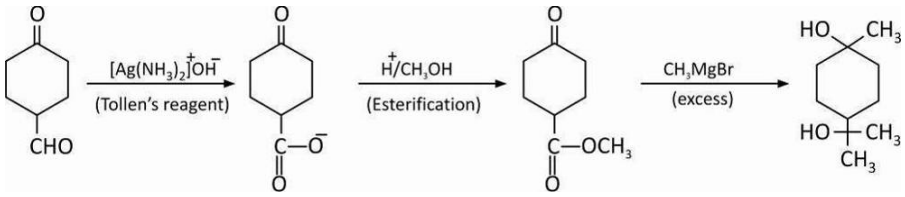
13.(D)



14.(B) DIBAL-H reduces only ester group to an aldehyde and alcohol.

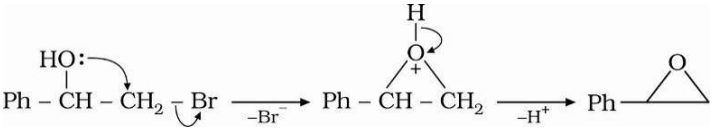


15.(B)

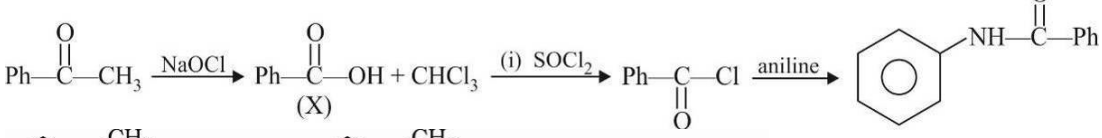


16.(B) Visualise cross cannizzaro reaction

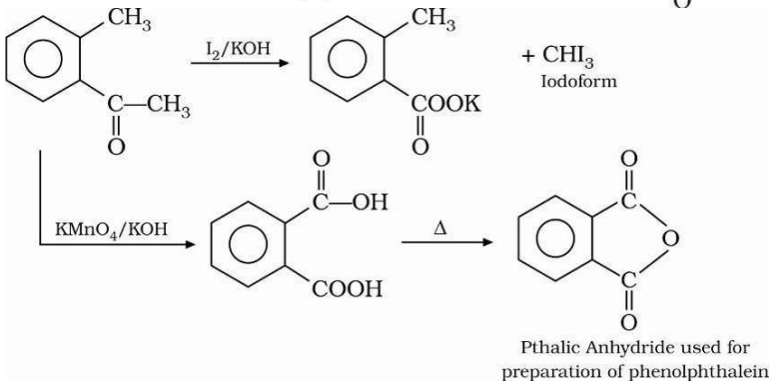
17.(B) $NaBH_4$ reduces keto group to 2° ol group. Visualise intramolecular S_N2 attack to get oxirane.



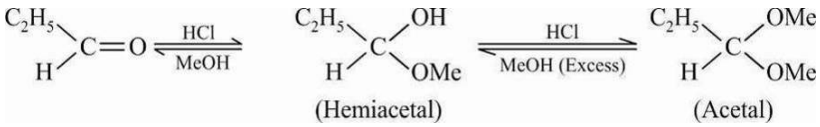
18.(B)



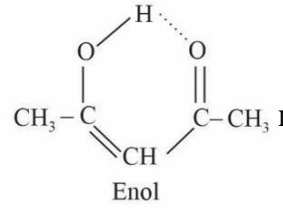
19.(D)



20.(B)



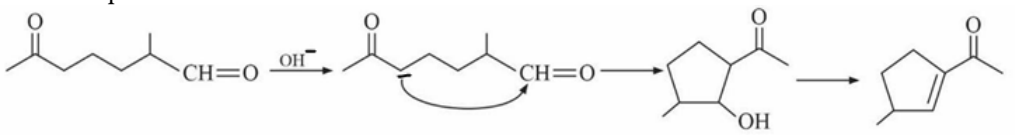
- More the intensity of +ve charge on carbon atom of carbonyl group, more is the reactivity towards nucleophilic addition reaction. So propanal is more reactive than acetone.
- Excess of MeOH shifts the equilibrium is forward direction.

21.(A) 

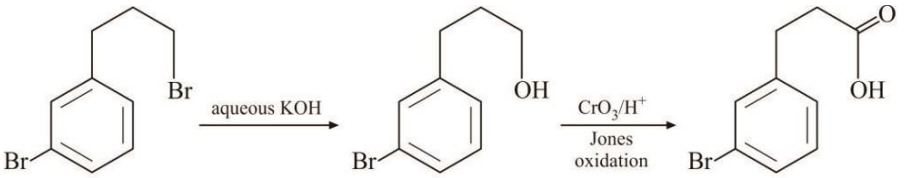
Enol

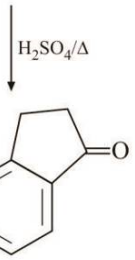
Due to intramolecular H-bonding enol content is maximum

22.(C) It is example of intramolecular aldol condensation.



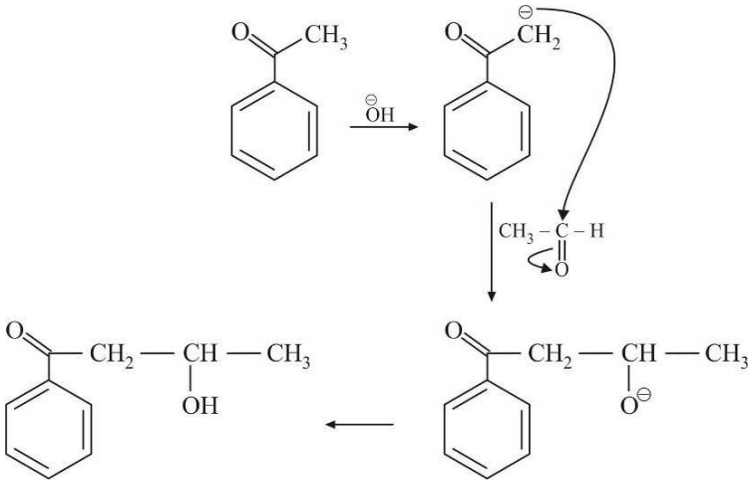
23.(D)





(para attack favoured due to less steric hindrance)

24.(A)

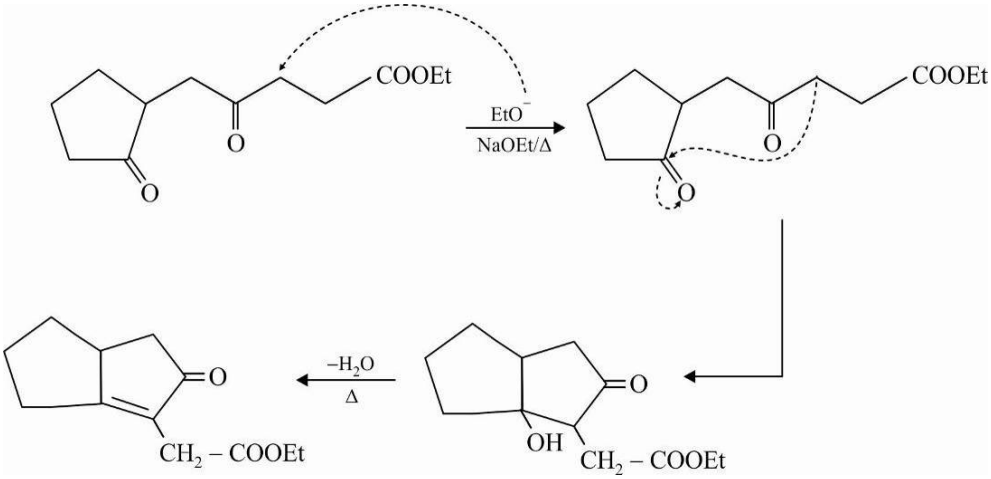


25.(D) Both aldehyde and ketone give 2, 4-DNP test.

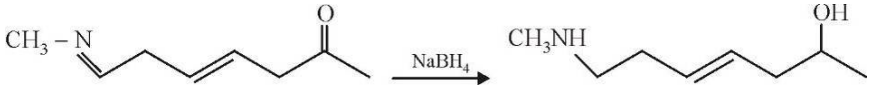
Iodoform test is given by $-\overset{\overset{O}{\|}}{C}-CH_3$ and $-\overset{\overset{OH}{|}}{\underset{\underset{OH}{|}}{C}}-CH_3$

No dye formation in case of 3° amine.

26.(D)

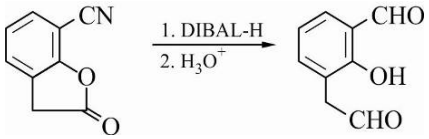


27.(B)



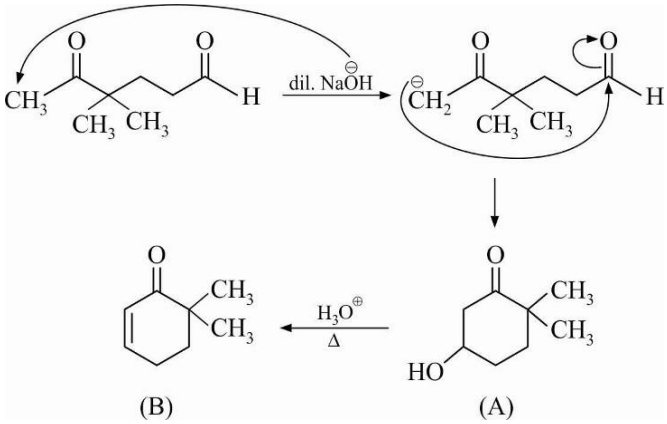
$NaBH_4$ can reduce carbonyl and imine but not alkene

28.(D)



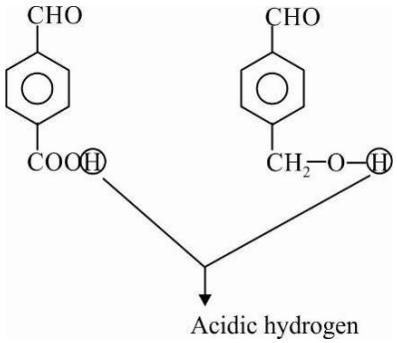
DIBAL-H reduces nitriles to imines and ester to aldehyde.

29.(A)

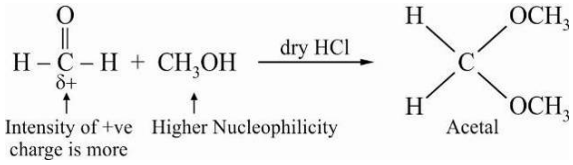


30.(D) Lower the molecular weight, lower is the van der Waal's force of attraction, hence lower is the melting point.

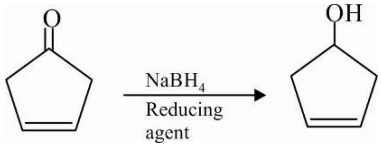
31.(D)



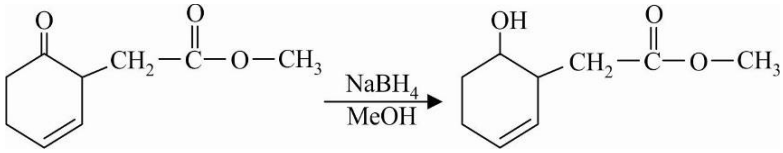
32.(A)



33.(B)

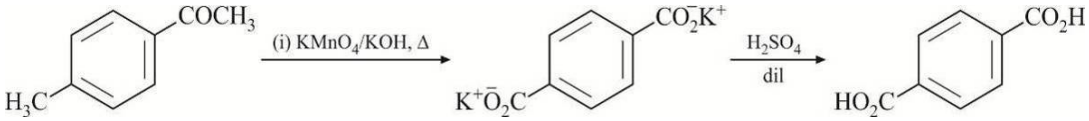


34.(C)

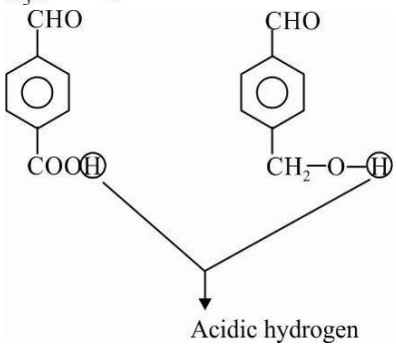


$NaBH_4$ reduces carbonyl but not ester or alkene.

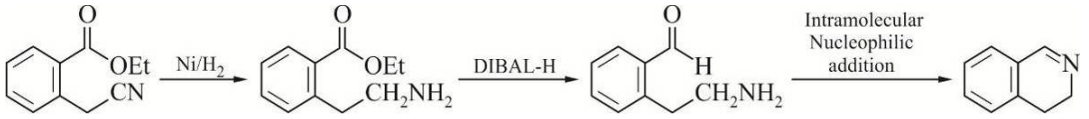
35.(A)



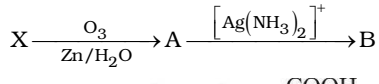
36.(D)

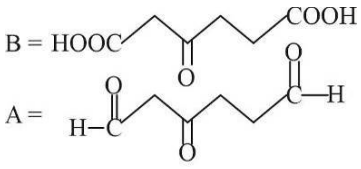


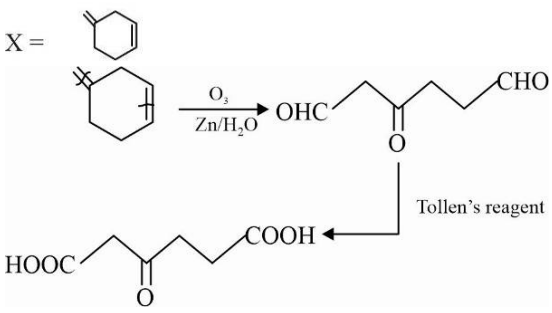
37.(D)



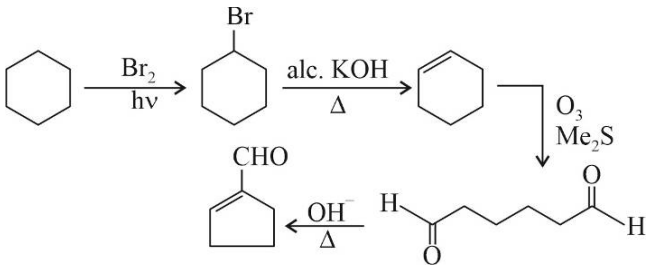
38.(B)



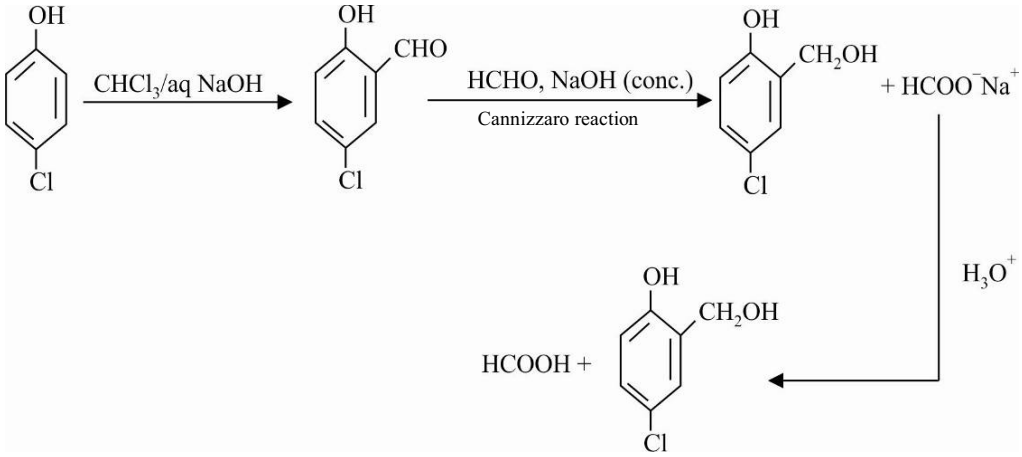




39.(B)


Br
Br_2
hν
alc. KOH
Δ
O_3
Me_2S
CHO
OH^-
Δ
H
O
O
H

40.(C)


OH
Cl
$CHCl_3$/aq NaOH
OH
CHO
Cl
HCHO, NaOH (conc.)
Cannizzaro reaction
OH
CH_2OH
Cl
+ $HCOO^-Na^+$
H_3O^+
OH
CH_2OH
HCOOH +
Cl