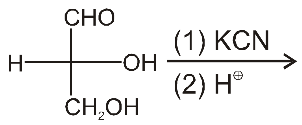
1. The treatment of CH3MgX with CH3C^{0}C–H produces

(a) $CH_3C \equiv C - CH_3$ (b) $CH_3 - \overset{H}{\overset{|}{C}} = \overset{H}{\overset{|}{C}} - CH_3$

(c) CH_4 (d) $CH_3 - CH = CH_2$

2. 

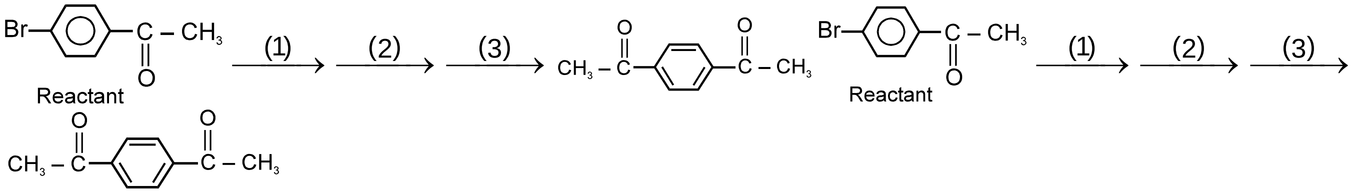
Products

Products obtained in the reaction is-

(a) Diastereomer (b) Racemic mixture

(c) Meso compound (d) Optically pure enantiomer

3.



(a) (1) $\begin{matrix} CH_2 - OH \\ | \\ CH_2 - OH \end{matrix} / H^{\oplus}$ (2) Mg / 

(3) $H - \underset{\underset{O}{\|}}{C} - O - H$ / H^+

(b) (1) $\begin{matrix} CH_2 - OH \\ | \\ CH_2 - OH \end{matrix} / H^{\oplus}$ (2) Mg / 

(3) $CH_3 - \underset{\underset{O}{\|}}{C} - O - Et$ / H^+

(c) (1) $\begin{matrix} CH_2 - OH \\ | \\ CH_2 - OH \end{matrix} / H^{\oplus}$ (2) Mg / THF

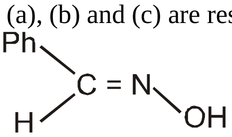
(3) $CH_3 - \underset{\underset{O}{\|}}{C} - O - Et$ / H^+

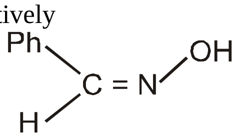
(d) (1) $\begin{matrix} CH_2 - OH \\ | \\ CH_2 - OH \end{matrix} / H^{\oplus}$ (2) Mg / THF

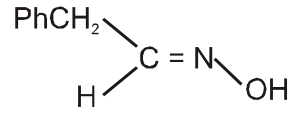
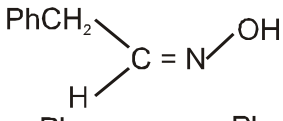
(3) $H - \underset{\underset{O}{\|}}{C} - O - H$ / H^+

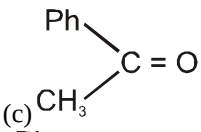
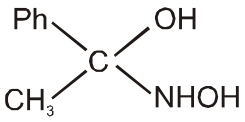
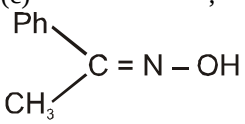
4. Consider the following sequence of reactions-.PhC º CH $\xrightarrow[\text{dil.}H_2SO_4]{HgSO_4}$ A $\xrightarrow{NH_2OH}$ B + C.

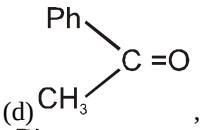
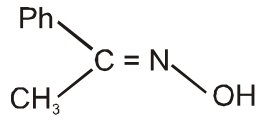
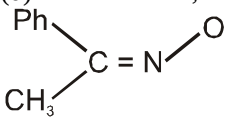
The products (a), (b) and (c) are respectively

(a) PhCHO, 

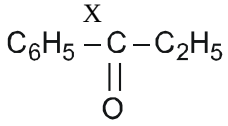
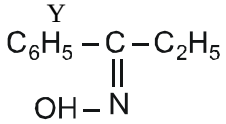
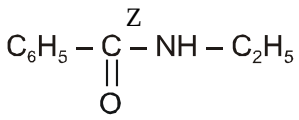
and 

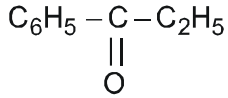
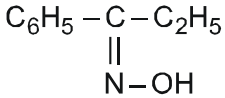
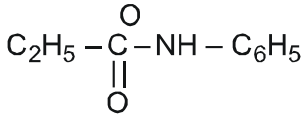
(b) $PhCH_2CHO$,  and 

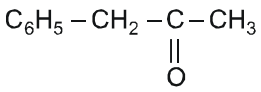
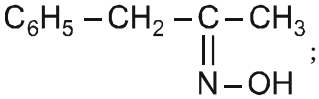
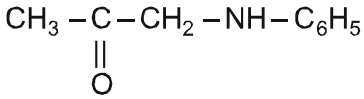
(c)  ,  and 

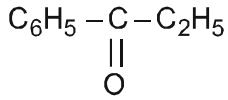
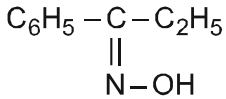
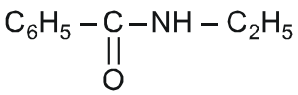
(d)  ,  and 

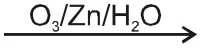
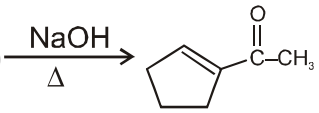
5. Compound (X) $C_9H_{10}O$ gives yellow coloured ppt with 2,4 DNP but does not give red coloured ppt with Fehling's solution. (X) on treatment with NH_2OH/H^+ gives compound (Y) $C_9H_{11}NO$. (Y) when treated with PCl_5 gives isomeric compound (Z). (Z) on hydrolysis gives propanoic acid and aniline. What will be the correct structure of (X), (Y) and (Z) ?

(a)  ;  ; 

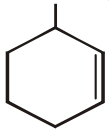
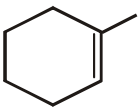
(b)  ;  ; 

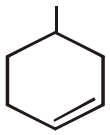
(c)  ;  ; 

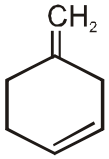
(d)  ;  ; 

6. (a)  (b) 

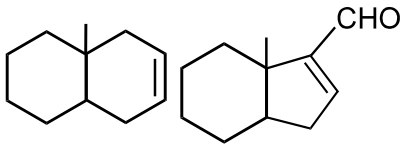
The reactant (a) will be :

(a)  (b) 

(c) 

(d) 

7.



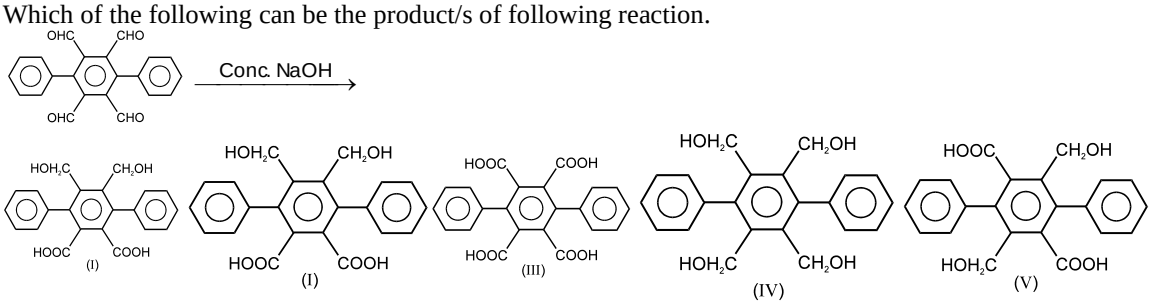
(a) $\xrightarrow[(1)]{O_3/Zn,H_2O} \xrightarrow[(2)]{OH^{\ominus}} \xrightarrow[(3)]{\Delta}$

(b) $\xrightarrow[(1)]{CrO_3} \xrightarrow[(2)]{H^{\oplus}}$

(c) $\xrightarrow[(1)]{N_2H_4} \xrightarrow[(2)]{OH^{\ominus}} \xrightarrow[(3)]{\Delta}$

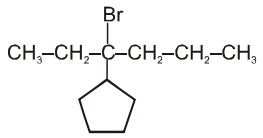
(d) $\xrightarrow[(1)]{KMnO_4/H^{+}} \xrightarrow[(2)]{OH^{\ominus}}$

8. Which of the following can be the product/s of following reaction.



(a) I, II, IV (b) III, IV (c) II, V (d) I, V

9.



$\xrightarrow[(-HBr)]{\text{alc. KOH}}$ (mixture of alkenes) $\xrightarrow[(ii)\ Zn/H_2O]{(i)\ O_3}$ (mixture of carbonyl compounds)

The incorrect statement is

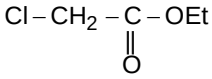
(a) Total five alknes are obtained

(b) Total six different carbonly compounds are obtained on ozonolysis

(c) All carbonly compounds can give aldol reaction when treated with dil KOH

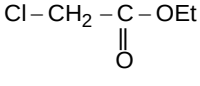
(d) Only two carbonly compounds give positive iodoform test

10.

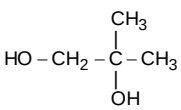


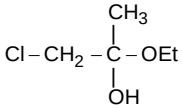
$+ \ 2CH_3MgI \xrightarrow[\text{by } H_2O]{\text{Followed}}$ product.

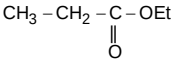
What is the product.

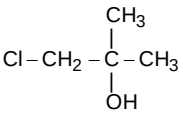


$+ \ 2CH_3MgI \xrightarrow[\text{by } H_2O]{\text{Followed}}$

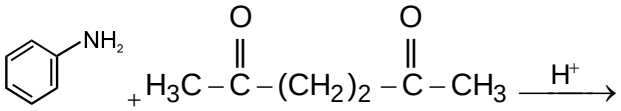
(a) 

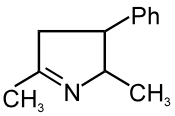
(b) 

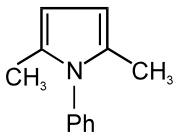
(c) 

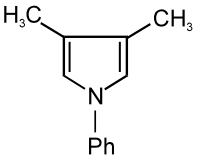
(d) 

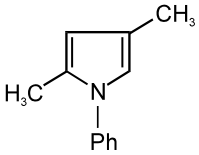
11. What will be the product of the following reaction



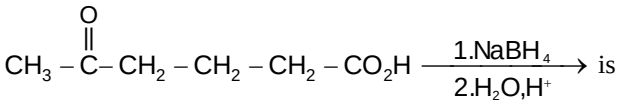
(a) 

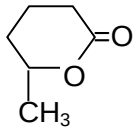
(b) 

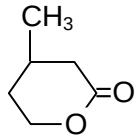
(c) 

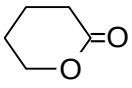
(d) 

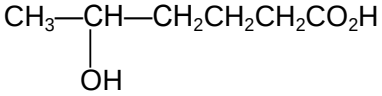
12. End product of this conversion



(a) 

(b) 

(c) 

(d) 

13. The pK_a of acetylsalicylic acid (aspirin) is 3.5 . The pH of gastric juice in human stomach is about 2-3 and pH in the small intestine is about 8. Aspirin will be.

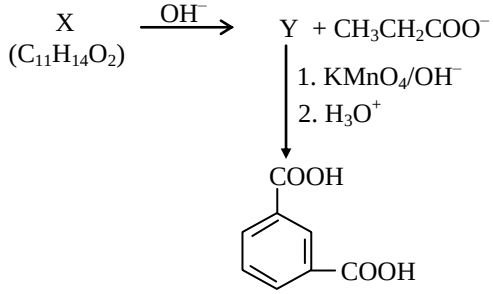
(a) Unionized in the small intestine and in the stomach

(b) Completely ionized in the stomach and almost unionized in the small intestine.

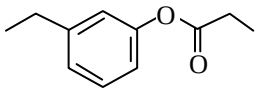
(c) Ionized in the stomach and almost unionized in the small intestine

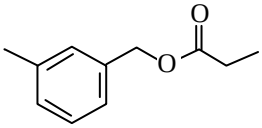
(d) Ionised in the small intestine and almost unionised in the stomach

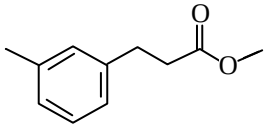
14. Consider the following sequence of reactions :

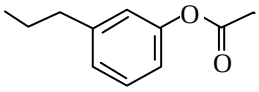


The compound 'X' is -

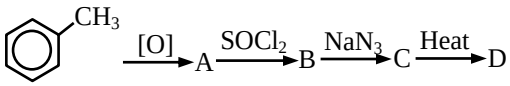
(a) 

(b) 

(c) 

(d) 

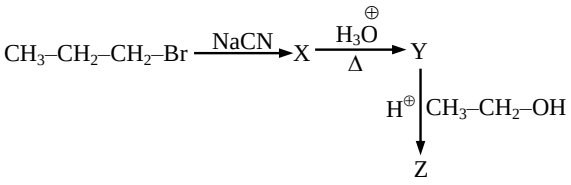
15. In the following sequence of reaction, what is D ?



(a) Primary amine (b) An amide
(c) Phenyl isocynate (d) A chain lengthened hydrocarbon

16. Acrylic acid react with HBr to give -
(a) $Br–CH_2–\underset{\displaystyle Br}{\underset{|}{CH}}–COOH$ (b) $Br–CH_2–CH_2–COOH$
(c) $CH_2=CH–COBr$ (d) $CH_3–\underset{\displaystyle Br}{\underset{|}{CH}}–COOH$

17. What is compound Z ?



(a) $CH_3–CH=CH\overset{\displaystyle O}{\overset{\|}{C}}OH$
(b) $CH_3–CH_2–CH_2CH=NOCH_2CH_3$
(c) $CH_3–CH_2–CH_2CH(OCH_2CH_3)_2$
(d) $CH_3–CH_2–CH_2–\overset{\displaystyle O}{\overset{\|}{C}}–OCH_2CH_3$

18. On vigorous oxidation by permanganate solution $(CH_3)_2C = CH–CH_2–CH_3$ gives
(a) $CH_3–\overset{\displaystyle OH}{\overset{|}{\underset{\displaystyle CH_3}{\underset{|}{C}}}}—\overset{\displaystyle OH}{\overset{|}{CH}}–CH_2–Cl_3$
(b) $\begin{matrix}CH_3\\ \diagdown\\ \diagup\\ CH_3\end{matrix}CH–CO_2H+CH_3–CH_2–COOH$
(c) $\begin{matrix}CH_3\\ \diagdown\\ \diagup\\ CH_3\end{matrix}CHOH+CH_3–CH_2–CH_2–OH$
(d) $\begin{matrix}CH_3\\ \diagdown\\ \diagup\\ CH_3\end{matrix}C=O+CH_3–CH_2–COOH$

19. The strongest acid among the following is -
(a) CF_3COOH (b) CCl_3COOH
(c) CBr_3COOH (d) CH_3COOH

20. Formic acid can be distinguish from acetic acid because formic acid :
(a) Release H_2 with sodium (b) Gives ester with alcohol
(c) Reduces $AgNO_3$ (d) Turns red litmus to blue

21. $CH_3–CH_2–CH_2–COOH \xrightarrow{Red\ P+Br_2} CH_3-CH_2-\underset{\displaystyle Br}{\underset{|}{CH}}-COOH$ This reaction is called
(a) Cannizzaro reaction
(b) Schmit reaction
(c) Hell Volhard Zelinsky reaction
(d) Reimer tiemann reaction

22. Synthesis of an ester involves the reaction of alcohols with
(a) A ketone (b) An amide (c) CH_3MgBr (d) RCOCl

23. Ethanol on heating with acetic acid in the presence of a few drops of sulphuric acid gives the smell of
(a) Oil of wintergreen (b) Oil of mustard

(c) Fruity smell (d) Oil of bitter almonds

24. An organic compound X ($C_4H_8O_2$) gives positive test with NaOH and phenopthalein. Structure of X will be :

(a) $CH_3-CH_2-CH_2-\underset{\underset{O}{\|}}{C}-OH$

(b) $CH_3-\underset{\underset{O}{\|}}{C}-\underset{\underset{O}{\|}}{C}-CH_3$

(c) $CH_3-\underset{\underset{O}{\|}}{C}-O-C_2H_5$

(d) $CH_3-\underset{\underset{O}{\|}}{C}-OCH_3$

25. A compound with molecular formula $C_4H_{10}O_4$ on acylation with acetic anhydride gives a compound with molecular formula $C_{12}H_{18}O_8$. How many hydroxyl groups are present in the compound?

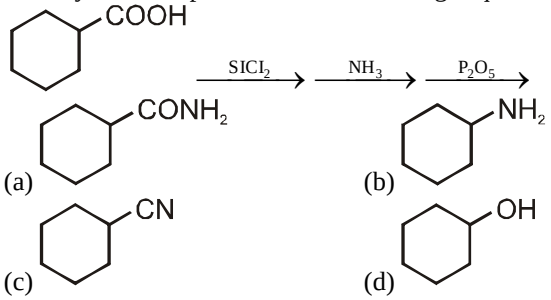
(a) One (b) Two (c) Three (d) Four

26. When excess of chlorine is passed through acetic acid in presence of red phosphorus, it forms

(a) Acetic anhydride (b) Chloral

(c) Trichloroacetic acid (d) Methyl chloride.

27. Identify the final product in the following sequence of reaction.



(a) (b) (c) (d)

28. Which of the following ester have most acidic α-hydrogen atom.

(a) $CH_3COOC_2H_5$

(b) $O_2N-CH_2-\underset{\underset{O}{\|}}{C}-OC_2H_5$

(c) $NC-CH_2-\underset{\underset{O}{\|}}{C}-OC_2H_5$

(d) $CH_3-\underset{\underset{O}{\|}}{C}-CH_2-\underset{\underset{O}{\|}}{C}-OC_2H_5$

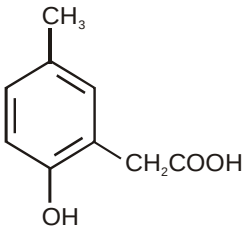
29. End product of the following reaction is :

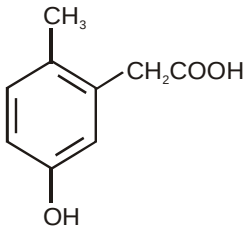
$CH_3CH_2COOH \xrightarrow[\text{red P}]{Cl_2} \xrightarrow{\text{alcoholic KOH}}$

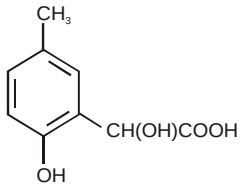
(a) $CH_3\underset{\underset{OH}{|}}{C}HCOOH$ (b) $\underset{\underset{OH}{|}}{C}H_2CH_2COOH$

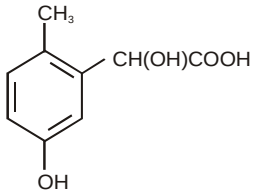
(c) $CH_2 = CHCOOH$ (d) $\underset{\underset{Cl}{|}}{C}H_2\underset{\underset{OH}{|}}{C}HCOOH$

30. p-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form, the compound B. The latter on acidic hydrolysis gives chiral carboxylic acid. The structure of the carboxylic acid is :

(a) 
CH3
CH2COOH
OH

(b) 
CH3
CH2COOH
OH

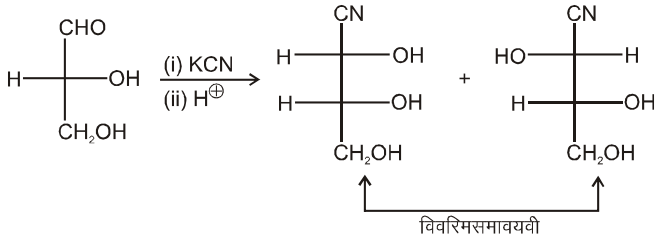
(c) 
CH3
CH(OH)COOH
OH

(d) 
CH3
CH(OH)COOH
OH

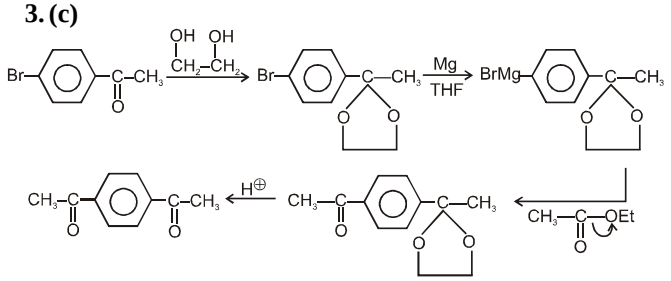
1. (c)

$CH_3MgX + CH_3 - C \equiv CH \longrightarrow CH_4 + CH_3 - C \equiv C - MgX$

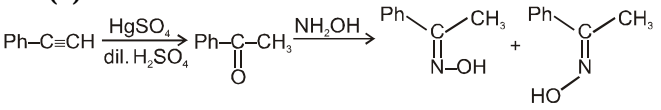
2. (a)



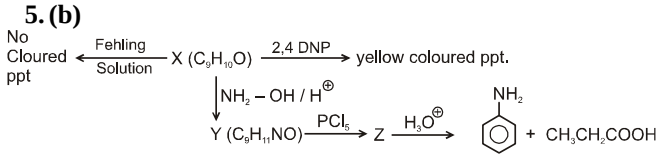
3. (c)

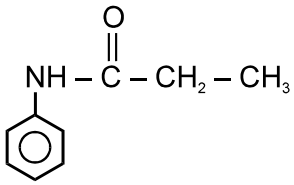
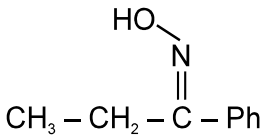
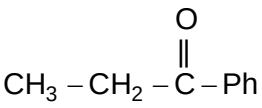


4. (d)

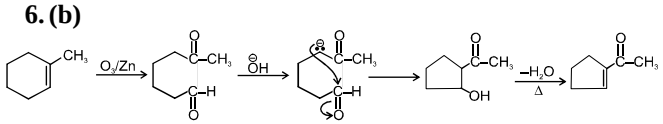


5. (b)

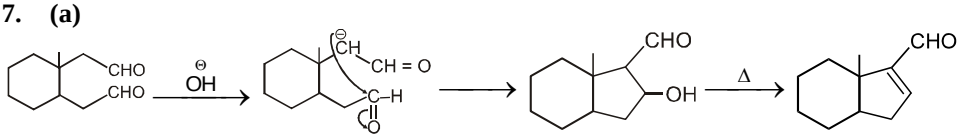


Z=  Y=  X= 

6. (b)



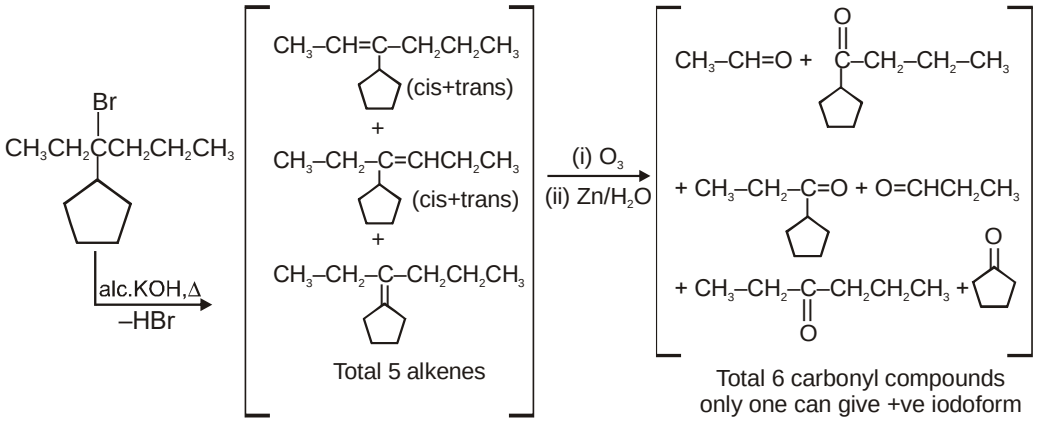
7. (a)



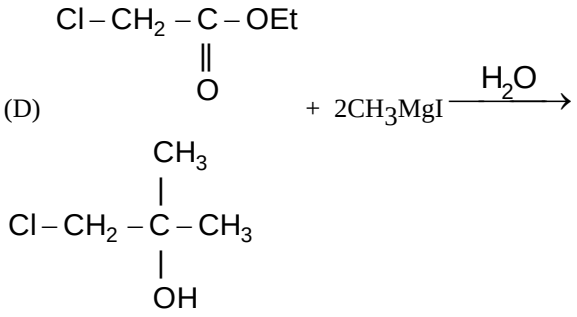
8. (c)

It is an intramolecular cannizzaro reaction

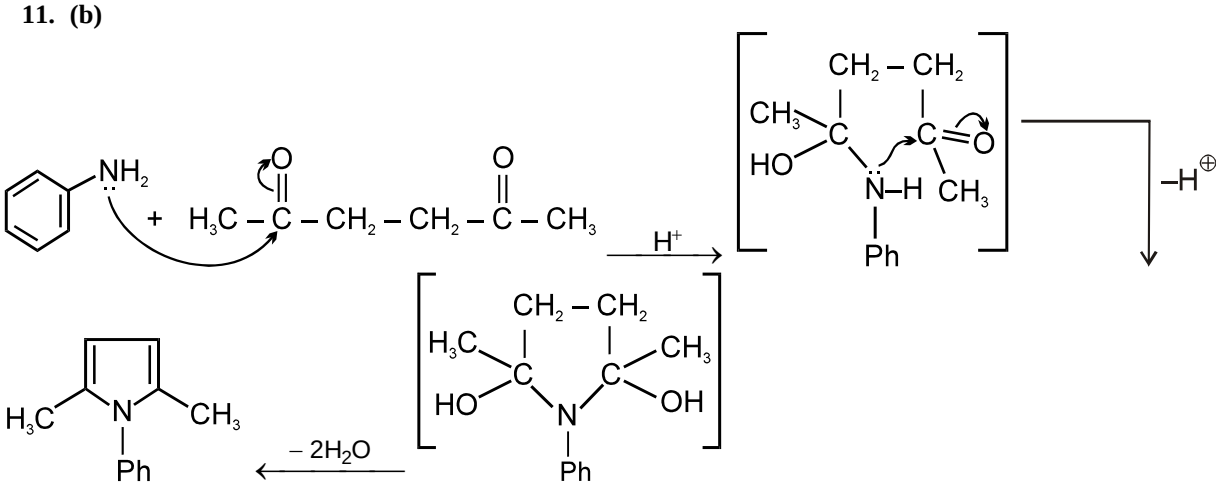
9. (d)



10. (d)

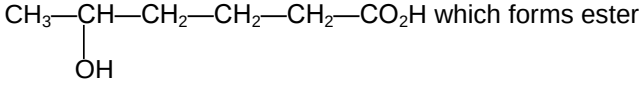


11. (b)



12. (a)

$NaBH_4$ reduces reactant to

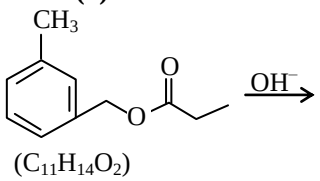


which forms ester

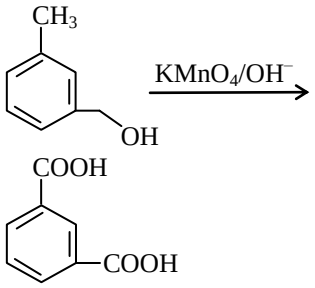
13. (d)

More ionized in basic medium and less ionized in acidic medium, common ion effect

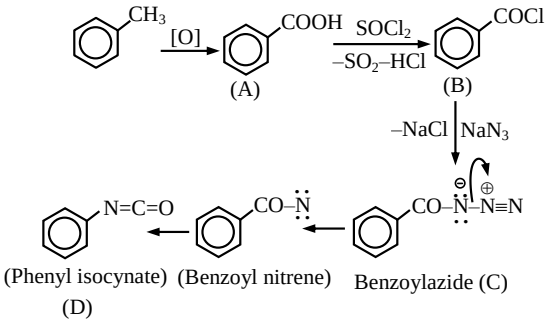
14. (b)



$(C_{11}H_{14}O_2)$

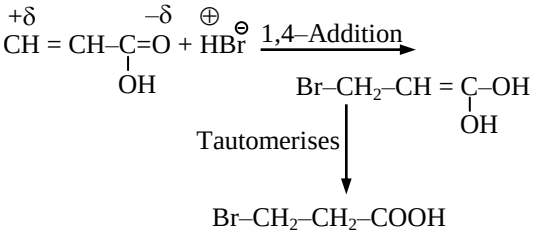


15. (c)



16. (b)

1, 4 Addition occurs to α, β unsaturated carbonyl compound.



17. (d)

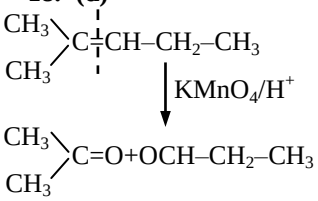
X = $CH_3–CH_2–CH_2–C\equiv N$

Y = $CH_3–CH_2–CH_2–CO_2H$

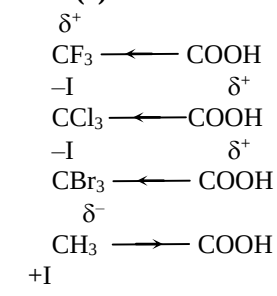
Z = $CH_3–CH_2–Cl_2–\overset{O}{\overset{\|}{C}}–OEt$

Y ⟶ Z is esterificatin reaction

18. (d)



19. (a)



20. (c)

$$HCOOH \xrightarrow{AgNO_3+NH_4OH} CO_2 + H_2O + Ag\downarrow$$

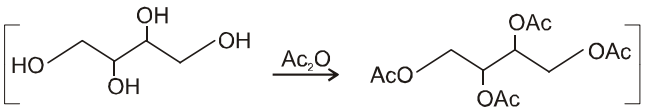
21. (c)
It is Hell Volhard Zelinsky reaction.

22. (d)
$$R{-}CH_2OH + RCOCl \longrightarrow R{-}CH_2{-}O{-}CO{-}R$$

23. (c)
$$CH_3{-}COOH + C_2H_5OH \xrightarrow{H^{\oplus}} CH_3COOC_2H_5 \text{ (ester)}$$

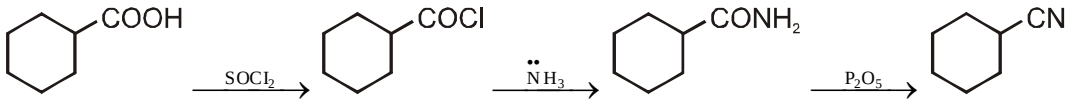
24. (c)
Ester gives positive test with NaOH and phenopthalein.

25. (d)
$$C_4H_{10}O_4 \xrightarrow{Ac_2O} C_{12}H_{18}O_8$$



26. (c)
HVZ reaction.

27. (c)



28. (b)
Acidic strength $\propto$ stability anion
$\propto -I$ and $-M$ group

29. (c)
$$CH_3CH_2COOH \xrightarrow[P]{Cl_2} CH_3\underset{\underset{Cl}{|}}{C}H-COOH \xrightarrow{KOH(alc.)} CH_2=CHCOOH$$

30. (c)
When two electron releasing groups are present the incoming group will occupy para or ortho position to the group which has more + R effect.