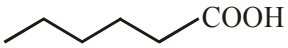
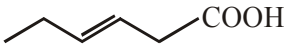
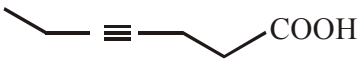
CARBOXYLIC ACID AND THEIR DERIVATIVES

1. What is the product of following reaction ?

Hex-3-ynal $\xrightarrow[\text{(ii) } PBr_3 \\ \text{(iii) Mg/ether} \\ \text{(iv) } CO_2/H_3O^+]{\text{(i) } NaBH_4}$?

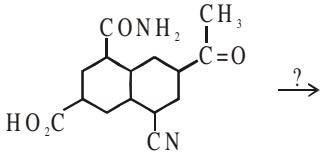
(1) 

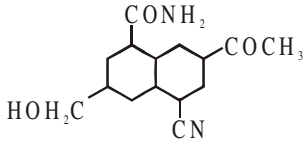
(2) 

(3) 

(4) 

2. The most suitable reagent for the given conversion is :



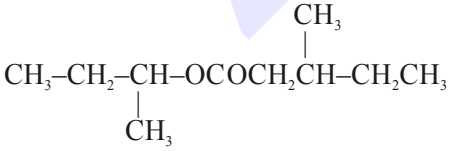


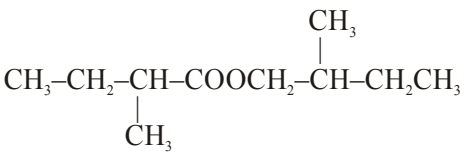
(1) $LiAlH_4$ (2) $NaBH_4$ (3) H_2/Pd (4) B_2H_6

3. An organic compound [A], molecular formula $C_{10}H_{20}O_2$ was hydrolyzed with dilute sulphuric acid to give a carboxylic acid [B] and alcohol [C]. Oxidation of [C] with $CrO_3 - H_2SO_4$ produced [B]. Which of the following structures are not possible for [A] ?

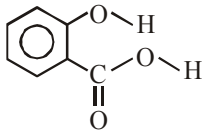
(1) $(CH_3)_3–C–COOCH_2C(CH_3)_3$

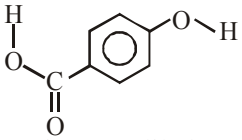
(2) $CH_3CH_2CH_2COOCH_2CH_2CH_2CH_3$

(3) 

(4) 

4. Consider the following molecules and statements related to them :

(A) 

(B) 

(a) (B) is more likely to be crystalline than (A)

(b) (B) has higher boiling point than (A)

(c) (B) dissolves more readily than (A) in water

Identify the correct option from below :

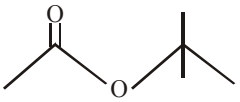
(1) only (a) is true

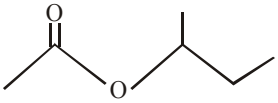
(2) (a) and (c) are true

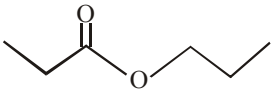
(3) (b) and (c) are true

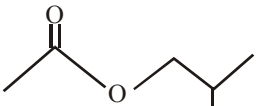
(4) (a) and (b) are true

5. An organic compound (A) (molecular formula $C_6H_{12}O_2$) was hydrolysed with dil. H_2SO_4 to give a carboxylic acid (B) and an alcohol (C). 'C' give white turbidity immediately when treated with anhydrous $ZnCl_2$ and conc. HCl. The organic compound (A) is :

(1) 

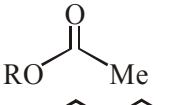
(2) 

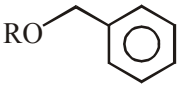
(3) 

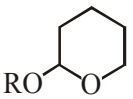
(4) 

6. Which of the following derivatives of alcohols is unstable in an aqueous base ?

(1) $RO - CMe_3$

(2) 

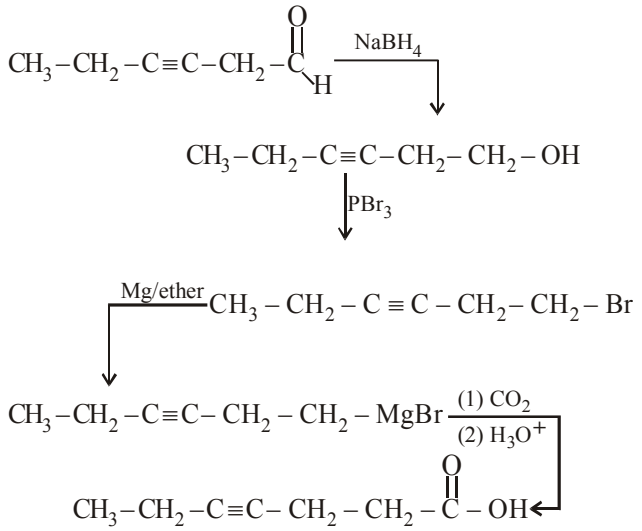
(3) 

(4) 

SOLUTION

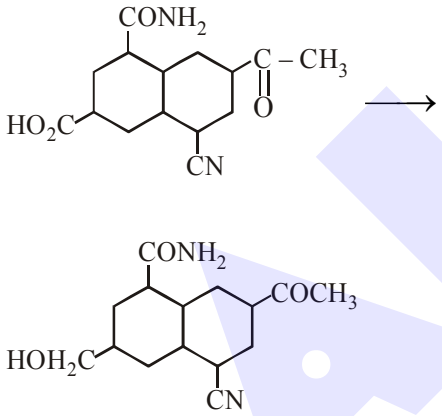
1. NTA Ans. (3)

Sol.



2. NTA Ans. (4)

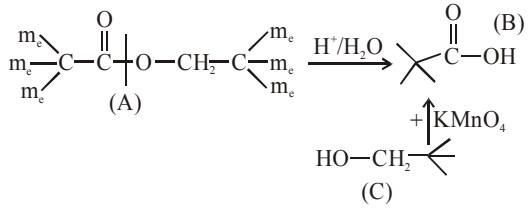
Sol.



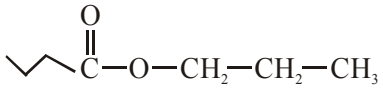
Most suitable reagent for given conversion is B_2H_6 (electrophilic reducing agent)

3. Official Ans. by NTA (3)
Official Ans. by ALLEN (2 & 3)

Sol. (1)

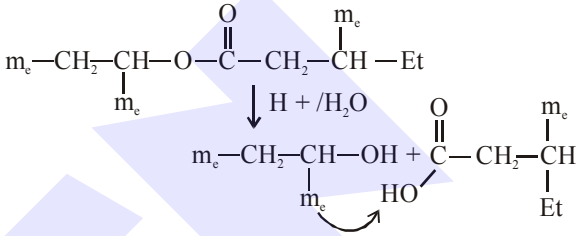


(2)



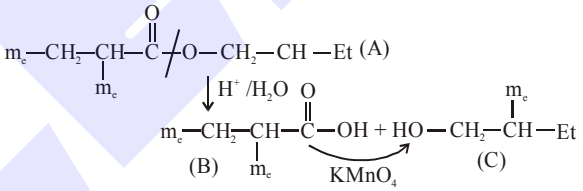
Total 8 'C' → so molecular formula not matched.

(3)



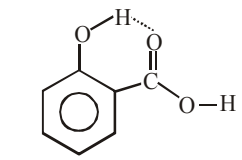
not inter convertible by oxidation

(4)

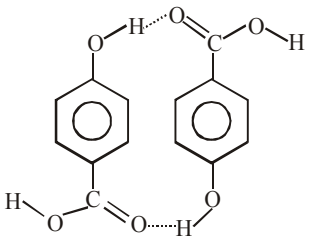


4. Official Ans. by NTA (3)
Official Ans. by ALLEN (2, 3 & 4)

Sol.



O-salicylic acid
intra molecular
H-bonding



p-salicylic acid
inter molecular H-bonding

(a) B will be more crystalline due to more inter molecular interactions hence more efficient packing.

(b) B will have higher boiling point due to higher intermolecular interactions.

(c) B will be more soluble in water than A as B will have more extent of H-bonding in water

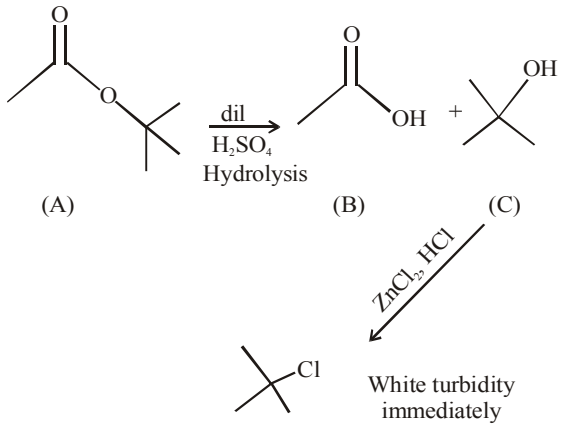
So all three statements are correct

{Solubility date ⇒ O-salicylic acid = 2g/L

P-salicylic acid = 5g/L}

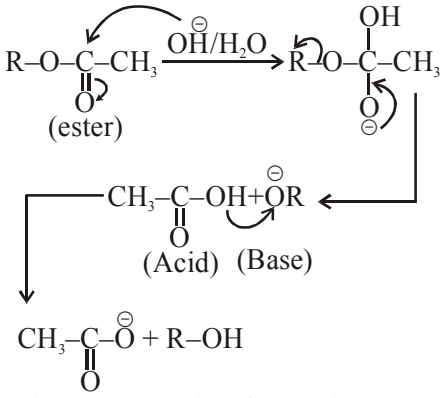
5. Official Ans. by NTA (1)

Sol.



6. Official Ans. by NTA (2)

Sol.



It is a hydrolysis of ester in basic medium.