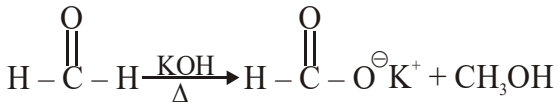
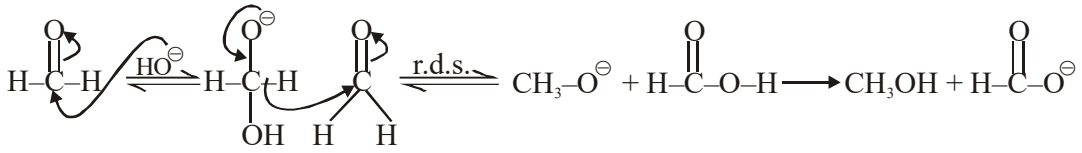
ALDOL & SIMILAR NAME REACTIONS

(1) CANNIZARO REACTION

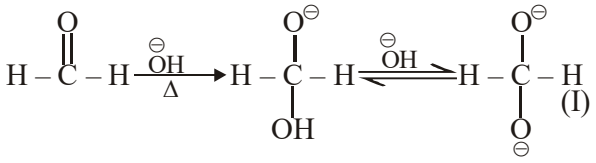
This reaction is given by aldehyde having no α- hydrogen in the presence of conc. NaOH/Δ or KOH/Δ.

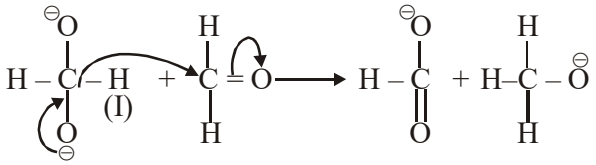


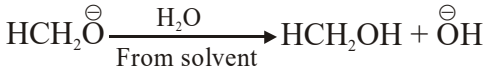
Mechanism :



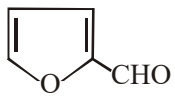
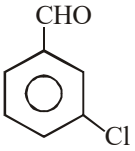
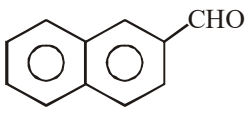
In the presence of a very strong concentration of alkali, aldehyde first forms a doubly charged anion (I) from which a hydride anion is transferred to the second molecule of the aldehyde to form acid and an alkoxide ion. Subsequently, the alkoxide ion acquires a proton from the solvent.



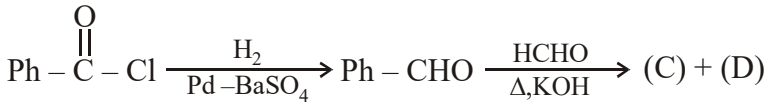




Q.1 Which of following will not undergo Cannizaro reaction

(A)  (B)  (C)  (D) $Cl_3C–CHO$

AR0001

Q.2 

Product (C) & (D) are :

(A) $Ph–CO_2H$, Ph–OH (B) $Ph–CO_2^-, HCO_2^-$

(C) $Ph–CH_2OH$, $H–CO_2^-$ (D) $Ph–CO_2^-, CH_3OH$ **AR0002**

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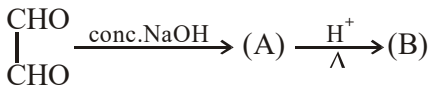
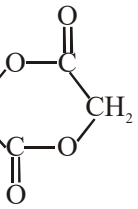
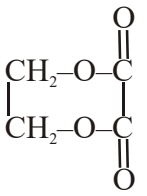
Q.3 

Product (B) is :

(A) $H_2C=CH-CO_2H$ (B)  (C)  (D) $H_2C=C=O$

AR0003

Q.4 (i) $HCHO \xrightarrow[\Delta]{NaOD}$ (ii) $DCHO \xrightarrow[\Delta]{NaOD}$ **AR0004**

Q.5 (i) $Ph-CHO \xrightarrow[\Delta]{\overset{\ominus}{O}D / DOD}$ (ii) $Ph-CHO \xrightarrow[\Delta]{{}^{18}\overset{\ominus}{O}H}$ **AR0005**

Q.6 (i) $Ph - CHO + HCHO \xrightarrow[\Delta]{KOH}$ (ii) $Ph - \underset{O}{\underset{\|}{C}} - \underset{O}{\underset{\|}{C}} - H \xrightarrow[\Delta]{KOH}$ **AR0006**

Q.7 (i) $MeCH_2 - CHO \xrightarrow[\Delta]{KOH}$ (ii) $Me_2CH - CHO \xrightarrow[\Delta]{conc.KOH}$ **AR0007**

Q.8 (i) $Me-NO_2 + HCHO \xrightarrow[(excess)]{KOH}$ (ii) $MeCHO - HCHO \xrightarrow[(excess)]{KOH}$ **AR0008**

Q.9 $PhCOCHBr_2 \xrightarrow{Aq.\bar{O}H} A \xrightarrow{Conc.\ \bar{O}H} B \xrightarrow{H^+}$; the compound 'C' is :

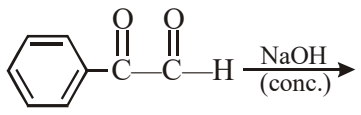
(A) PhCH(OH)CHO (B) PhCH(OH)COOH

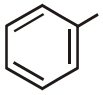
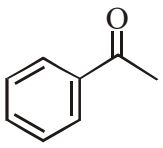
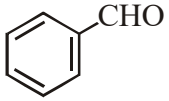
(C) PhCOOH (D) None of these **AR0009**

Q.10 Match the column :

Column - I	**Column - II**
(A) HCHO + NaOD (conc.)	(P) $DCOO^- + CDH_2OH$
(B) DCHO + NaOH (conc.)	(Q) $DCOO^- + CD_3OH$
(C) DCDO + NaOH (conc.)	(R) $DCOO^- + CDH_2OD$
(D) DCHO + NaOD (conc.)	(S) $HCOO^- + CH_3OD$

AR0010

Q.11  ; Product 'C' is :

(A) (B)  (C)  (D) 

AR0011

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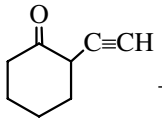
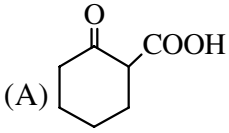
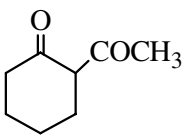
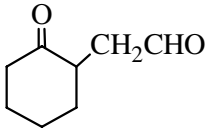
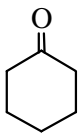
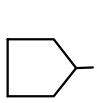
Q.12  $\xrightarrow{1\%\ HgSO_4\ /\ Dil.H_2SO_4}$ $\xrightarrow[H^+]{I_2\ /\ NaOH}$ $\xrightarrow{\Delta}$ X ; X is :

(A)  (B)  (C)  (D)  **AR0012**

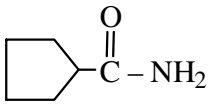
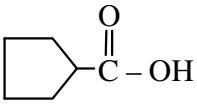
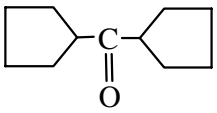
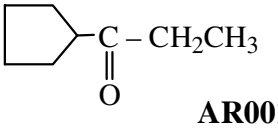
Q.13 The cannizaro reaction of Ph COCHO forms the product(s)

(A) $PhCOCH_2OH + PhCOCO_2^-$ (B) $PhCH(OH) - CO_2^-$

(C) $PhCO_2^- + PhCOCH_2OH$ (D) Both (A) and (C) **AR0013**

Q.14  $\xrightarrow[\Delta]{P_2O_5}$ A $\xrightarrow[(ii)H_3O^+]{(i)CH_3MgBr}$ B $\xrightarrow[(iii)-CHI_3]{(i)I_2+Ca(OH)_2\ (ii)\Delta}$ C ;

Product is:

(A)  (B)  (C)  (D) 

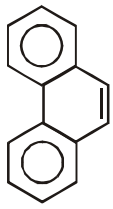
AR0014

Q.15 $\xrightarrow{conc.\ KOH}$

True about this reaction is / are

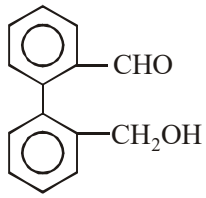
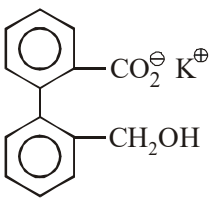
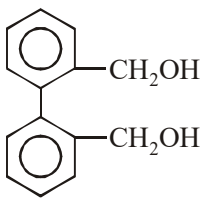
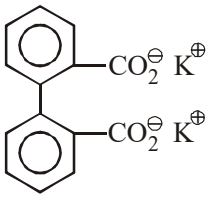
(A) Cannizaro name is associated with this reaction (B) It is a disproportion reaction

(C) It is a bimolecular reaction in r.d.s. (D) All of these **AR0015**

Q.16  $\xrightarrow[Zn]{O_3}$ (A) $\xrightarrow{conc.KOH}$ (B)

(1 mole)

End product (B) of above reaction is :

(A)  (B)  (C)  (D) 

AR0016

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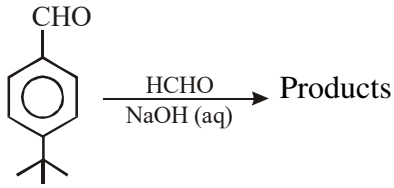
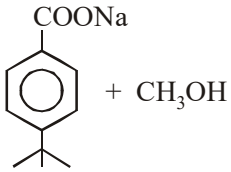
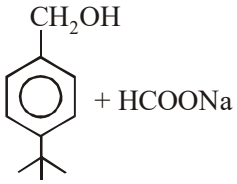
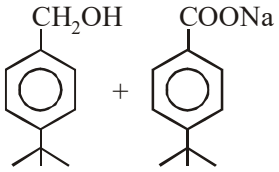
Q.17 The major product pair of the following reaction will be :



(A) 

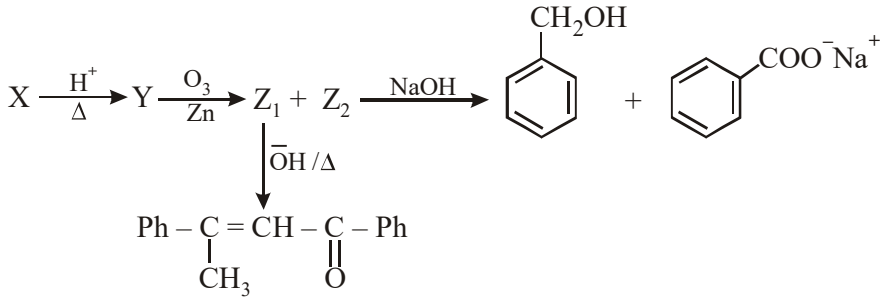
(B) 

(C) 

(D) $CH_3OH + HCOONa$

AR0017

Q.18 Reactant 'X' will be :



(A) $Ph-\underset{CH_3}{\underset{|}{CH}}-\underset{OH}{\underset{|}{CH}}-Ph$

(B) $Ph-\underset{Ph}{\underset{|}{CH}}-\underset{OH}{\underset{|}{CH}}-CH_3$

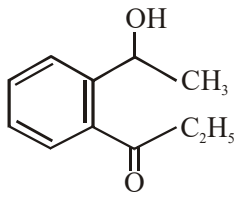
(C) $Ph-\underset{CH_3}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{\overset{OH}{\overset{|}{C}}}}-Ph$

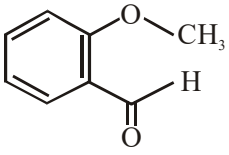
(D) $Ph-CH_2-\underset{OH}{\underset{|}{CH}}-Ph$

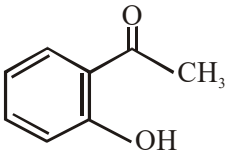
AR0018

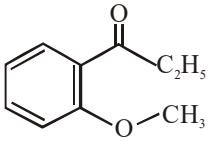
Q.19 An organic compound neither reacts with neutral ferric chloride solution nor with Fehling solution, It however, reacts with Grignard reagent and gives positive iodoform test. The compound is -

[JEE-MAIN (APRIL)-2019]

(1) 

(2) 

(3) 

(4) 

AR0019

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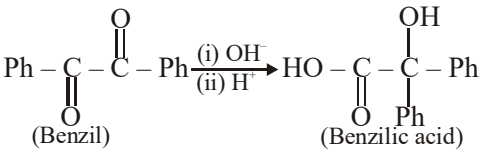
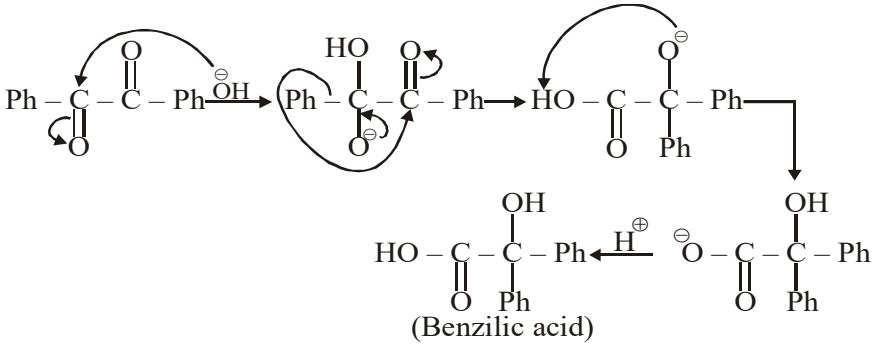
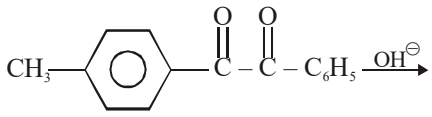
(2) BENZIL-BENZILIC REARRANGEMENT OR BENZILIC ACID REARRANGEMENT

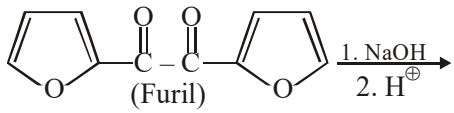
The base catalysed reaction of 1,2-diketones to a salt of –2– hydroxy carboxylic acid is known as Benzilic acid rearrangement, this reaction is mainly applicable when aryl group is present on both carbonyl carbons.

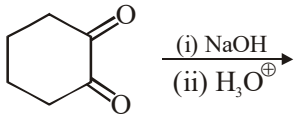


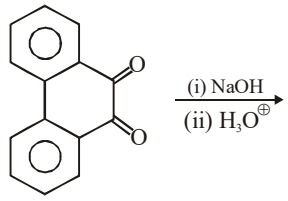
Mechanism :



Q.1  **AR0020**

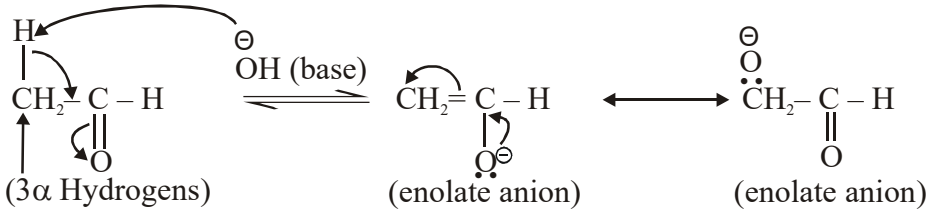
Q.2  **AR0021**

Q.3  **AR0022**

Q.4  **AR0023**

(3) ALDOL CONDENSATION

The α- hydrogen of carbonyl compounds are acidic due to the fact that the anion (enolate ion) is stabilized by resonance.



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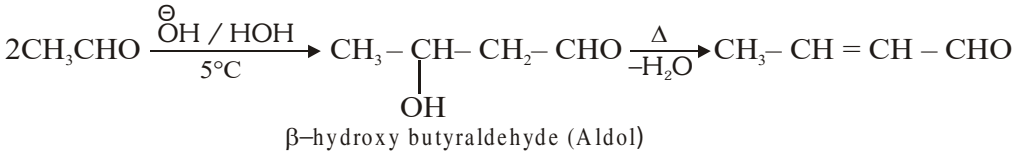
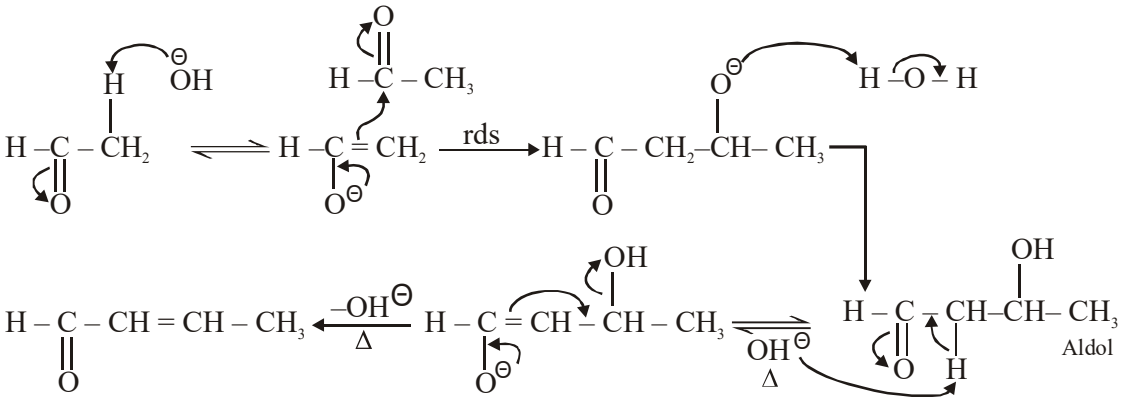
Base catalysed Aldol

In aqueous base, two acetaldehyde molecules react to form β-hydroxy aldehyde called aldol. The reaction is called Aldol condensation. The enolate ion is the intermediate in the aldol condensation of aldehyde and ketone. Acetaldehyde for instance, forms a dimeric product aldol in presence of a dilute base (≈ 10% NaOH)



Mechanism :

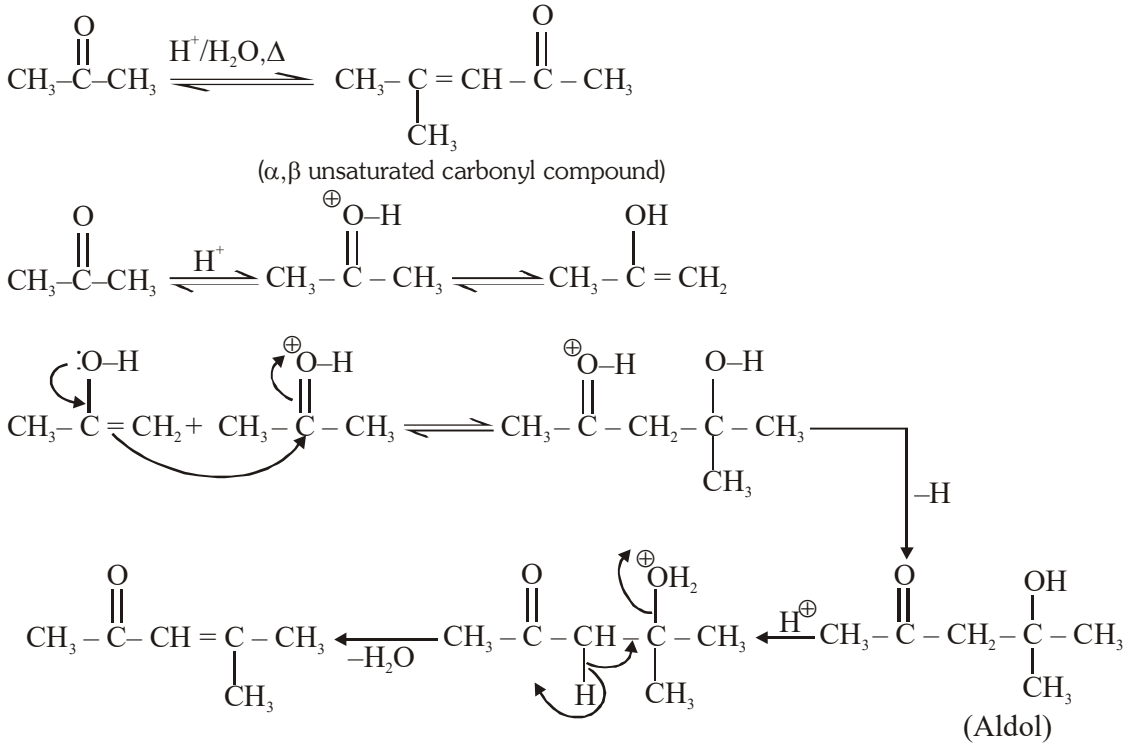


Aldols are stable and may be isolated. They, however can be dehydrated easily by heating the basic reaction mixture or by a separate acid catalyzed reaction. Thus if the above reaction is heated the product is dehydrated to 2-butenal (crotonaldehyde).

Acid cataysed Aldol

In acid catalysed aldol condensation enol form of carbonyl is the nucelophile in place of enolate.

Mechanism :



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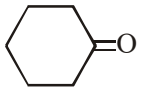
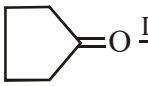
Q.1 Write the product and mechanism for given reactions.

(I) $CH_3-CH_2-\underset{\underset{O}{\|}}{C}-H \xrightarrow[\text{Dil NaOH}]{} (A) \xrightarrow{\Delta} (B)$ **AR0024**

(II)  **AR0025**

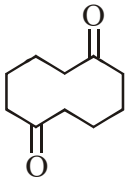
(III) $C_6H_5-CH_2-CHO \xrightarrow{\text{Dil NaOH}} (D)$ **AR0026**

(IV)  **AR0027**

(V) $C_6H_5-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{\text{Dil NaOH}} (G) \xrightarrow{\Delta} (H)$ **AR0028**

Q.2 Identify the intramolecular aldol product ?

(I) $CH_3-\overset{\overset{O}{\|}}{C}-CH_2-CH_2-\overset{\overset{O}{\|}}{C}-CH_3 \xrightarrow{\text{Dil NaOH}} (A) \xrightarrow{\Delta} (B)$ **AR0029**

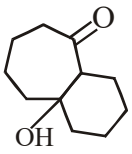
(II)  **AR0030**

Q.3 Find out the total number of possible aldol products (including and excluding stereo products).

(I) $C_6H_5-CHO + CH_3-CHO \xrightarrow[5°C]{\text{NaOH/ HOH}}$ **AR0031**

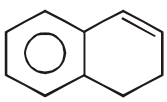
(II) $CH_3-CH=O + CH_3-CH_2-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[5°C]{\text{NaOH/ HOH}}$ **AR0032**

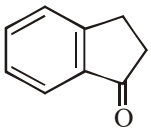
Q.4 Identify the structure of substrate ?

(I) A $\xrightarrow{\text{Dil. NaOH}}$  A = ? **AR0033**

(II) $\underset{(2\text{ mole})}{A} \xrightarrow[5°C]{\text{Dil.NaOH}} CH_3-\underset{\underset{O}{\|}}{C}-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}}-CH_3$ A = ? **AR0034**

Q.5 Complete reaction sequence :

(I)  $\xrightarrow[(ii)\ Zn / H_2O]{(i)\ O_3(1eq)} (a) \xrightarrow[(ii)\ \Delta]{(i)\ \overset{\ominus}{O}H} (b)$ **AR0035**

(II)  $\xrightarrow[(ii)C_6H_5CHO]{(i)\ \overset{\ominus}{O}H}$ Product **AR0036**

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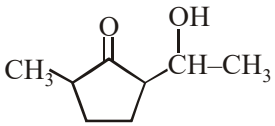
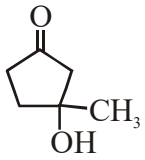
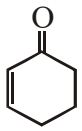
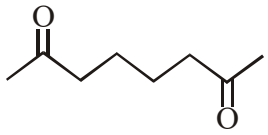
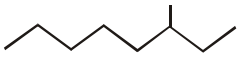
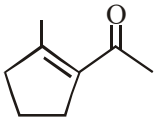
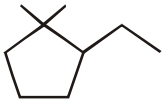
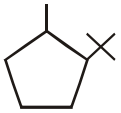
Q.6 Complete the following reactions :

(I) (X) + (Y) $\xrightarrow{\ominus OH}$  **AR0037**

(II) (X) $\xrightarrow{OH^{\ominus}}$  **AR0038**

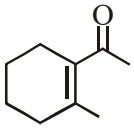
(III) [X] $\xrightarrow[(ii)\Delta]{(i)\ OH^{\ominus}}$  **AR0039**

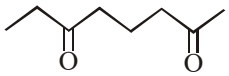
Q.7  $\xrightarrow[heat]{\bar{O}H}$ A $\xrightarrow[CuBr]{CH_3MgBr}$ B $\xrightarrow[conc.HCl]{Zn-Hg}$ C ; the product 'C' is

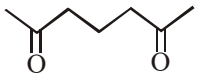
(A)  (B)  (C)  (D) 

AR0040

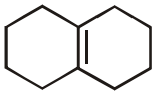
Q.8 Consider following intramolecular aldol condensation reaction :

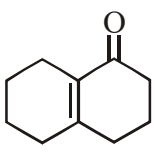
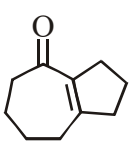
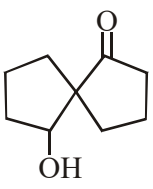
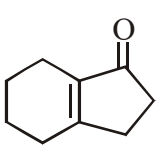
X $\xrightarrow[\Delta]{^{-}OH}$  ; X can be :

(A) (B) 

(C)  (D) **AR0041**

Q.9 Product 'Y' formed in the given reaction is :

 $\xrightarrow{O_3/Zn}$ X $\xrightarrow{\bar{O}H/\Delta}$ Y

(A)  (B)  (C)  (D) 

AR0042

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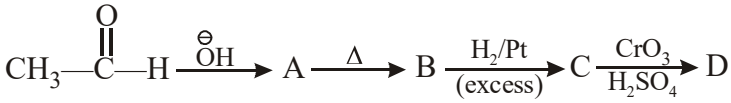
Q.10 Product 'D' is :



(A) $CH_3–CH_2–CH = CH_2$ (B) $CH_3–CH_2–CH_2–CHO$

(C) $CH_3–CH_2–CH_2–COOH$ (D) $CH_2 = CH – CH = CH_2$ **AR0043**

Q.11 $CH_3CH = CHCHO \xrightarrow[\text{aldol}]{OH^-} \xrightarrow{\Delta}$ A, A is :

(A) $CH_3(CH = CH)_3CHO$ (B) $CH_3CH_2CH_2(CH = CH)_2CHO$

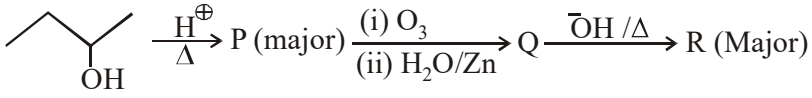
(C) $CH_3(CH_2CH_2)_3CH = CH – CHO$ (D) None is correct **AR00044**

Q.12 $MeCHO \xrightarrow{NaOH,\Delta} A \xrightarrow{NaOH,\Delta} B$; B is :

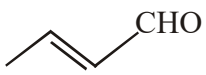
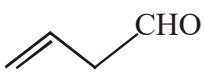
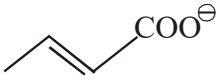
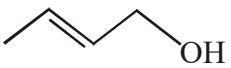
(A) $Me(CH=CH)_3CHO$ (B) MeCH=CHCHO

(C) $Me(CH=CH)_2–CHO$ (D) $Me-(CH=CH)_4CHO$ **AR0045**

Q.13 For the given reaction :

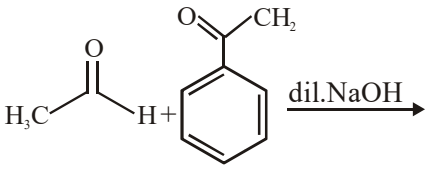


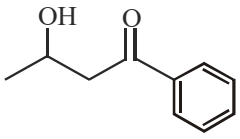
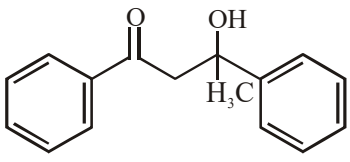
The (R) is :

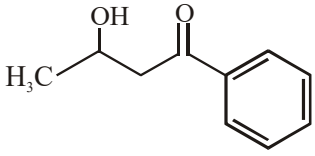
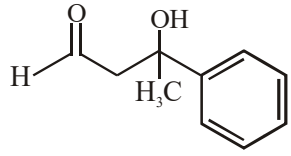
(A)  (B)  (C)  (D) 

AR0046

Q.14 The major product formed in the following reaction is: **[JEE-MAIN (JANUARY)-2019]**



(1)  (2) 

(3)  (4)  **AR0047**

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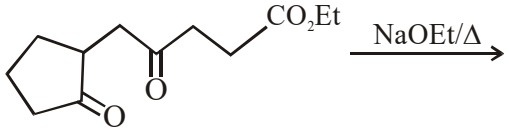
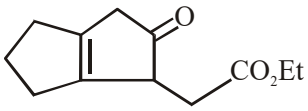
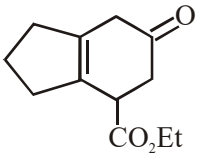
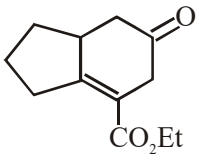
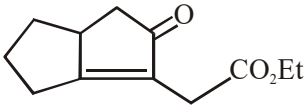
Q.15 The major product obtained in the following reaction is : **[JEE-MAIN (JANUARY)-2019]**



(1) 

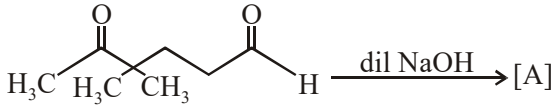
(2) 

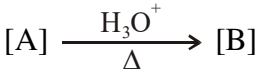
(3) 

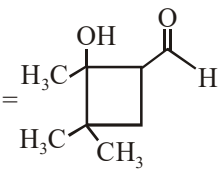
(4) 

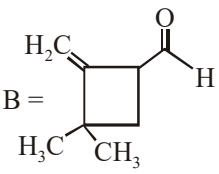
AR0048

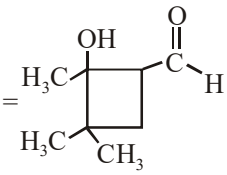
Q.16 In the following reactions, products A and B are : **[JEE-MAIN (JANUARY)-2019]**

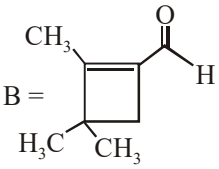


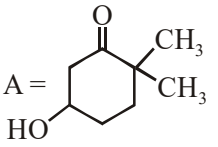


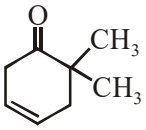
(1) A = 

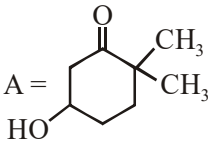
; B = 

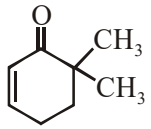
(2) A = 

; B = 

(3) A = 

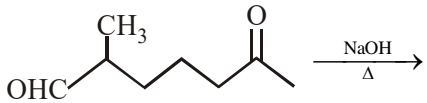
; B = 

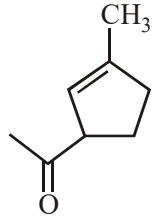
(4) A = 

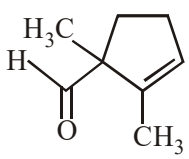
; B = 

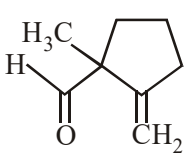
AR0049

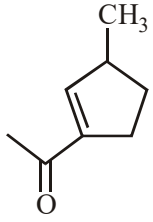
Q.17 The major product obtained in the following reaction is **[JEE-MAIN (APRIL)-2019]**



(1) 

(2) 

(3) 

(4) 

AR0050

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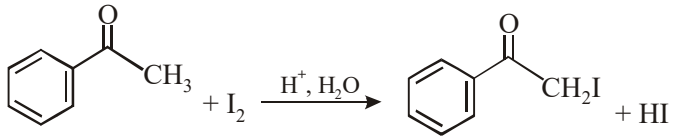
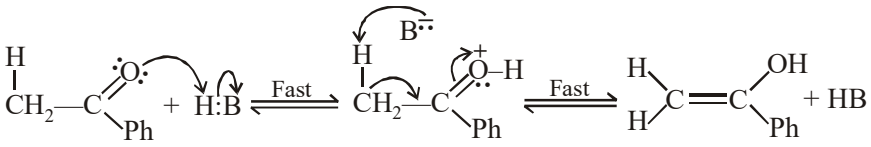
(4) HALOGENATION OF THE α-CARBON OF ALDEHYDES AND KETONES

I[st] Acid-Catalyzed halogenation : - When Br_2, Cl_2 and I_2 is added to an acidic solution of an aldehyde or a ketone, a halogen replaces one of the α-hydrogens of the carbonyl compound. Halogenation takes place through the slow formation of an enol followed by rapid reaction of the enol with the halogen.



Mechonism :

Step - I :



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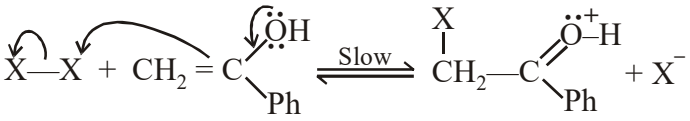

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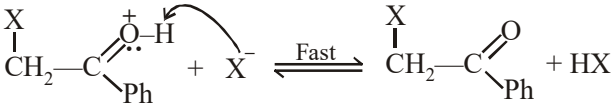
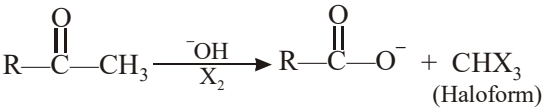
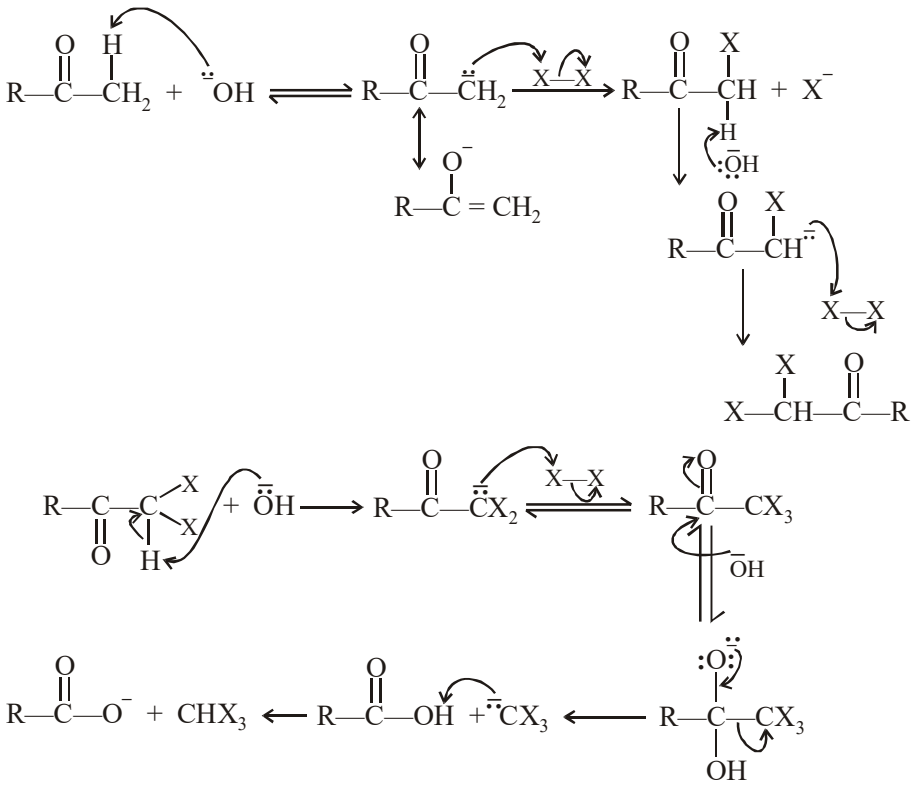


II[nd] Base-Catalyzed halogenation : - In the presence of excess base and excess halogen, a methyl ketone is converted first into a trihalo-substituted ketone and then into a carboxylic acid.

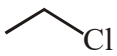
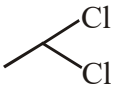
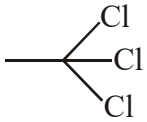


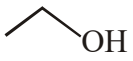
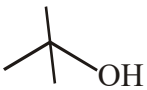
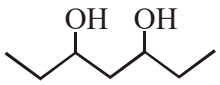
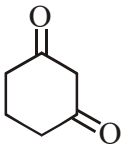
Mechanism :

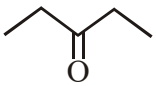


node06\B0BO-BA\Kota\JEE(Advanced)\Leader\Che\Sheet\Aldol & Similar Name Rxn\Eng\01. Theory.p65

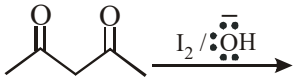
Q.1 Identify the compounds which can show iodoform test and complete the reaction ?

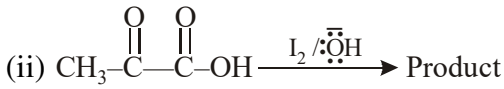
(1)  (2)  (3)  (4)

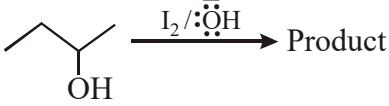
(5)  (6)  (7)  (8) 

(9) (10)  (11) CI_3CHO **AR0051**

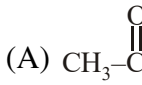
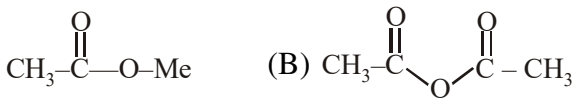
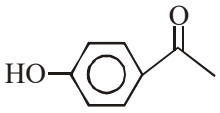
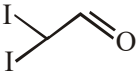
Q.2 Complete the following given reaction :

(i)  **AR0052**

(ii)  **AR0053**

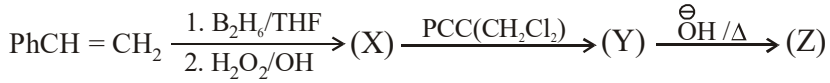
(iii)  **AR0054**

Q.3 Select the compound which does not show haloform reaction is/are :

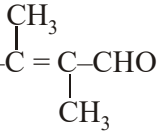
(A)  (B)  (C)  (D) 

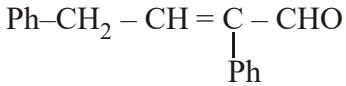
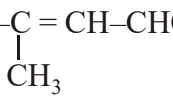
AR0055

Q.4 For the reaction



(Z) is :

(A) Ph–CH=CH–CHO (B) 

(C)  (D)  **AR0056**

Q.5 Two isomeric ketones, 3-pentanone and 2-pentanone can be distinguished by :

(A) I_2 / NaOH (B) NaOH (C) NaCN / HCl (D) 2,4-DNP **AR0057**

Q.6 Which of the reagent is used to convert 2–Butanone into propanoic acid -

(A) NaOH, I_2/H^+ (B) Tollen's reagent (C) Fehling solution (D) NaOH, NaI/H^+

AR0058

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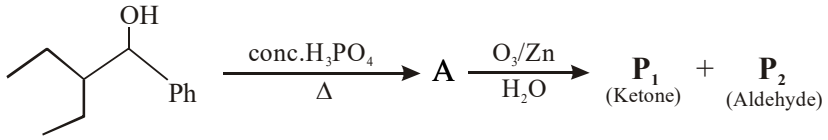
Paragraph for Q.07 to Q.09



Q.7 Which one of the following reagent is best suitable for distinction between P_1 and P_2 -
(A) Braddy's reagent (2,4 DNP) (B) $NaHSO_3$
(C) $NaHCO_3$ (D) NaOH / I_2 **AR0059**

Q.8 Select the correct statement among the following -
(A) P_1 will show aldol reaction & P_2 will show cannizaro reaction
(B) P_1 will show cannizaro reaction & P_2 will show aldol reaction
(C) Both P_1 & P_2 will show cannizaro reaction
(D) Both P_1 & P_2 will show aldol reaction **AR0060**

Q.9 $P_2 \xrightarrow[(ii)\ H^+]{\text{conc. NaOH}}$ products

Select incorrect statement for the above reaction -
(A) It is a redox reaction
(B) It is a disproportion reaction
(C) Two products formed are alcohol & carboxylic acid
(D) It is an intramolecular reaction **AR0061**

Q.10 Which of the following will give yellow precipitate with NaOH / I_2

(A) Ph–CH(OH)–Me (B) CI_3CHO (C) Me–C(=O)–C(=O)–OH (D) EtOH **AR0062**

Q.11 Ethylmethanoate $\xrightarrow[(ii)H_3O^+]{\text{(i)MeMgBr(2eq)}}$ $\underbrace{W + X}_{\text{organic product}}$

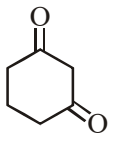
$W \xrightarrow{CaOCl_2} CHCl_3 + Y$

$X \xrightarrow{CaOCl_2} CHCl_3 + Z$

$Y + Z \xrightarrow[\text{Distillation}]{\text{Dry}}$ Organic product(s) + $CaCO_3$

Which of the following organic product can be formed on dry distillation reaction
(I) $CH_3 - CHO$ (II) $CH_3 - CO - CH_3$ (III) $CH_3 - CH = CH - CH_3$ (IV) HCHO
(A) I and II only (B) II and III only (C) I, II and IV only (D) II and IV only
AR0063

Q.12 Which of the following compounds(s) give a sweet smelling product having anesthetic use in presence of Cl_2, NaOH, Δ.

(A)  (B) $CH_3 - CH(I) - CH_3$ (C) $CH_3 - C(=O) - OH$ (D) $Ph - C(=O) - CH_3$
AR0064

Q.13 Reaction in which product can show positive haloform test :-

(A) $CH_3MgBr + PhCN \xrightarrow[H_3O^{\oplus}]{}$ (B) $CH_3–CH_2MgBr + Ph–COOEt \xrightarrow[H_3O^{\oplus}]{}$ (1 : 1)

(C) $CH_3MgBr + H–C(=O)–OMe \xrightarrow{NH_4Cl}$ (1 : 1) (D) $CH_3MgBr + H–C(=O)–H \xrightarrow{NH_4Cl}$ **AR0065**

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Q.14 In which reaction haloform is obtained as one product :-
(A) Electrolysis of ethanolic aqueous solution of NaCl
(B) Isopropanol with bleaching powder
(C) Chlorination of methane in sun light
(D) Chloral is treated with NaOH **AR0066**

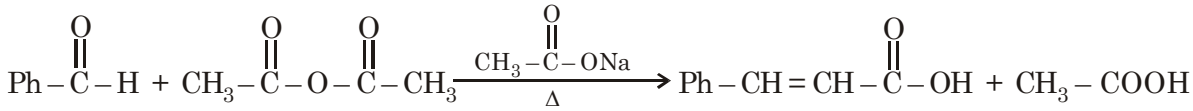
Q.15. Fructose and glucose can be distinguished by : **[JEE-MAIN (APRIL)-2019]**
(1) Fehling's test (2) Barfoed's test (3) Benedict's test (4) Seliwanoff's test **AR0067**

(5) PERKIN CONDENSATION

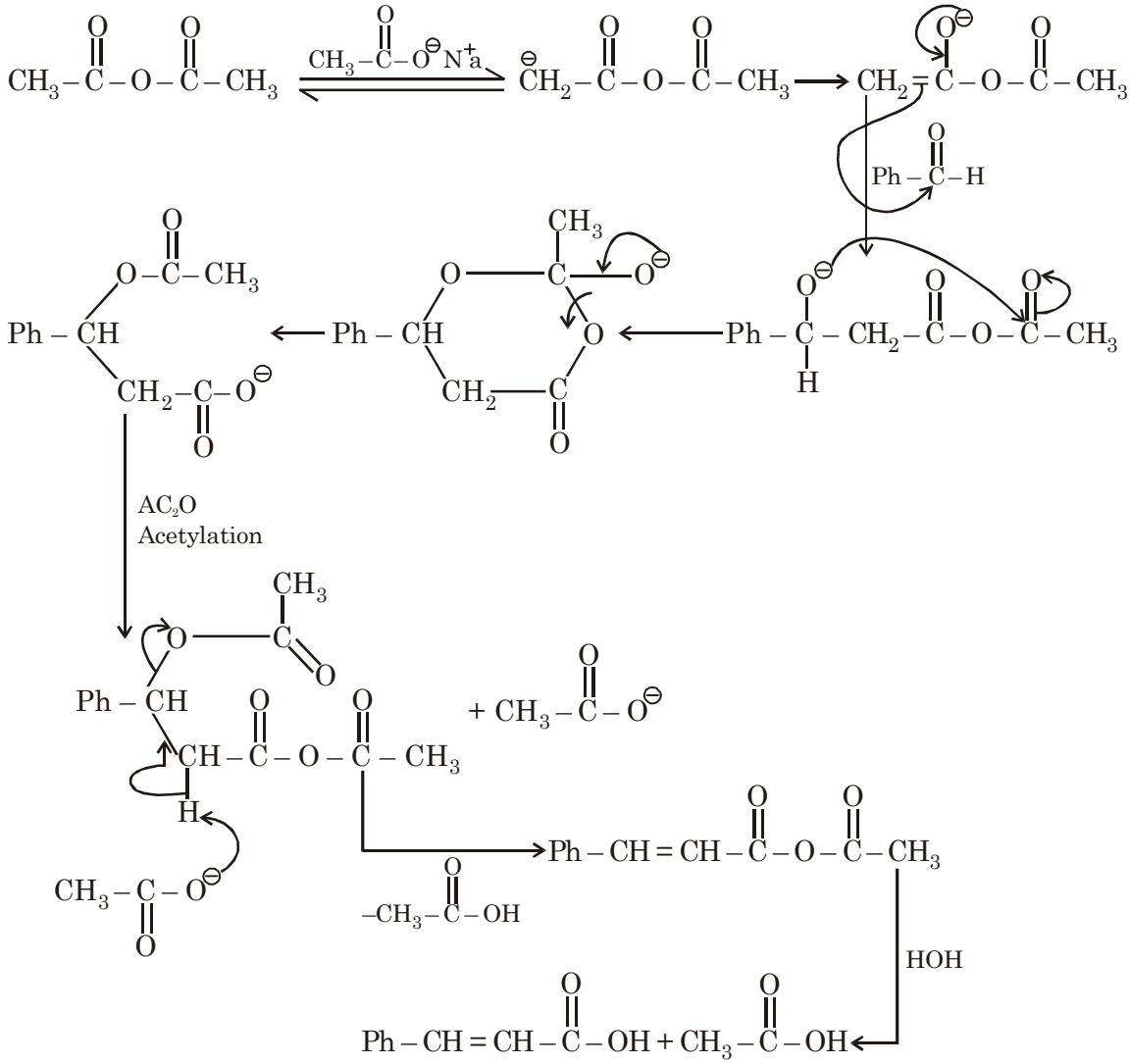
Perkin Reaction :

Condensation reaction between aromatic aldehyde and aliphatic acid anhydride having at least two alpha hydrogen in the presence of a base is known as **Perkin reaction**.

In this reaction, the anion of an acid anhydride adds to an aromatic aldehyde to produce an β aryl α,β, unsaturated acid. In order to prevent side reactions, the base that is used to make the anion of the anhydride is usually the sodium salt of the acid corresponding to the anhydride.



Mechanism :



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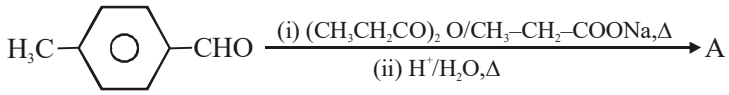
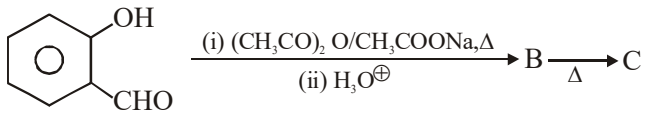
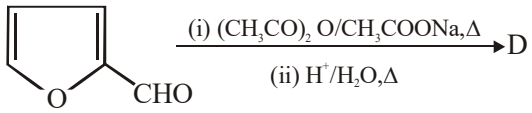
Q.1 

AR0068

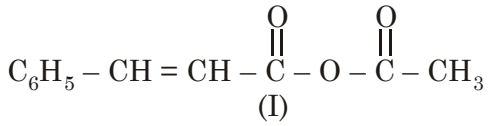
Q.2 

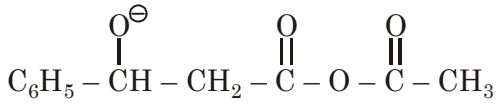
AR0069

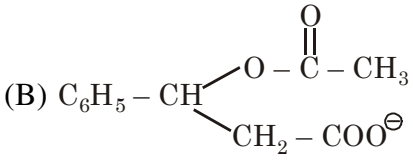
Q.3 

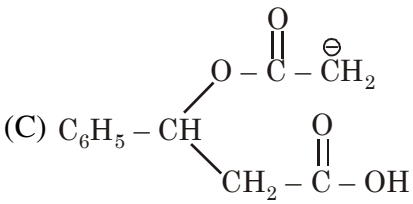
AR0070

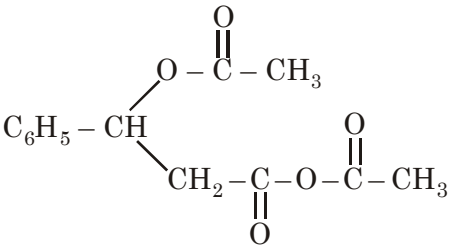
4. In the perkin reaction which one of the following intermediates gives compound (I)



(A) 

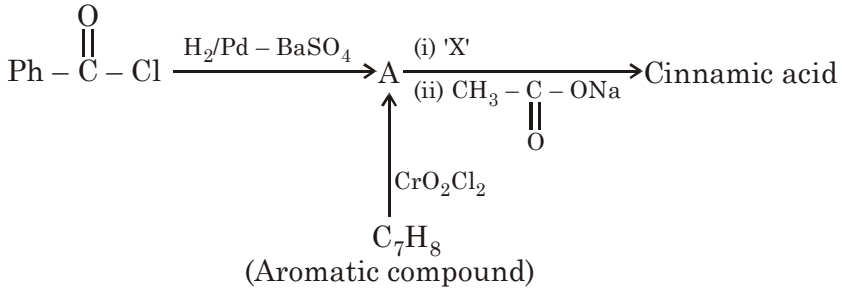
(B) 

(C) 

(D) 

AR0071

Paragraph for Q.no. 5-6



5. Compound 'A' on treatment with conc. NaOH followed by acidification can give :

(A) Ph – CH_2 – COOH (B) Ph – OH

(C) Ph – COOH (D) Ph – CH_2 – OH **AR0072**

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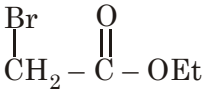
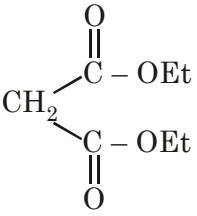
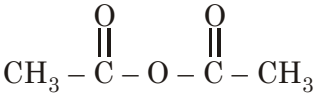
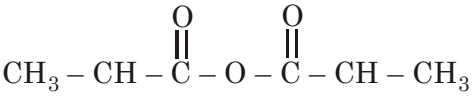
6. In the above reaction the reagent "X" can be :

(A) 

(B) 

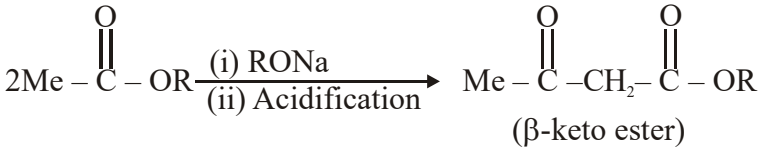
(C) 

(D) 

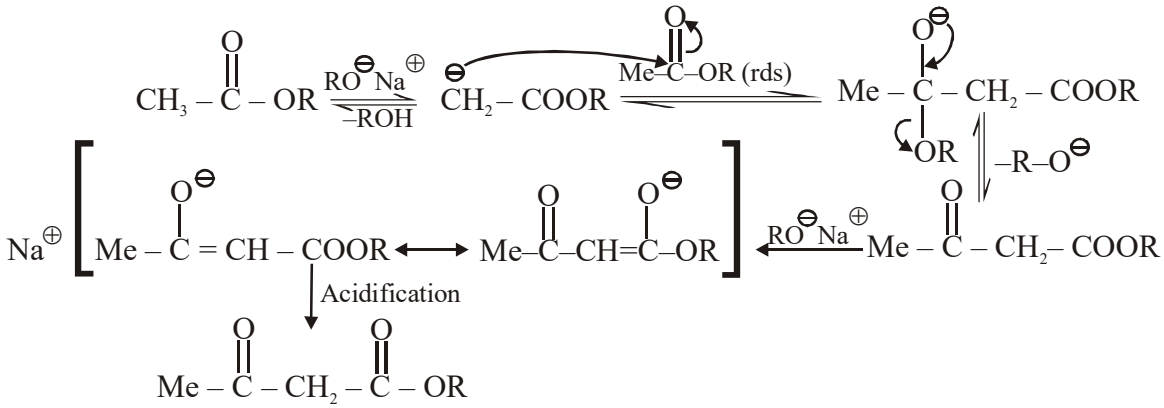
AR0073

(6) CLAISEN CONDENSATION

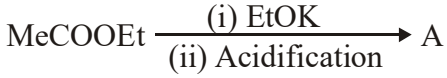
Esters undergo S_NAE Reaction. when attacked by a Nu^- generated by the interaction of a base (usually base related to the Alkoxy anion of ester) with one of the molecule of ester and this Nu^- attacks on another molecule. The reaction over all is considered as condensation of ester known as claisen ester condensation.

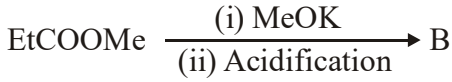


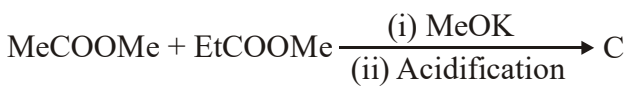
Mechanism :



Some times, when two ester group are p;resent within the molecule then the condensation occurs intramolecular then cyclization caused thus is known as Dieckmann cyclization or Dieckmann's condensation.

Q.1  **AR0074**

Q.2  **AR0075**

Q.3  **AR0076**

Q.4 **AR0077**

Ethyl benzoate

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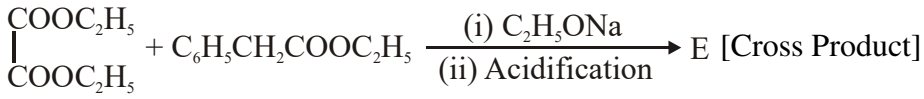
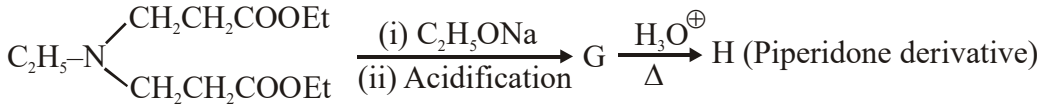
Q.5  **AR0078**

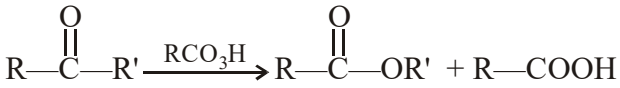
Q.6 **AR0079**

Q.7  **AR0080**

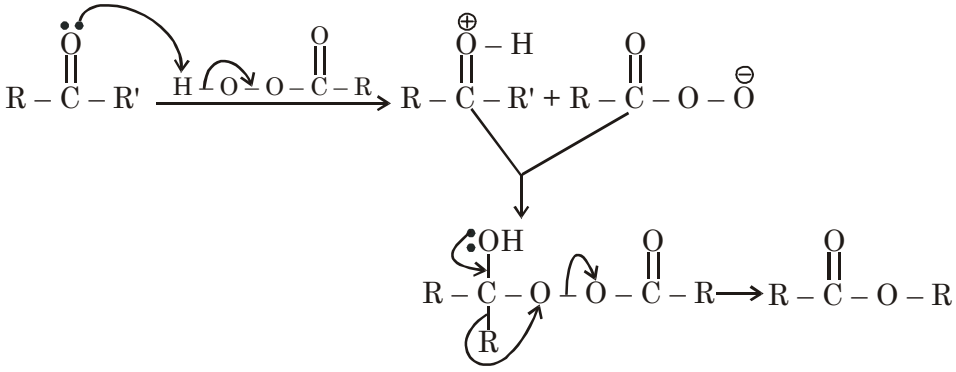
(7) Beayer villiger oxidation

Reaction involve the oxidation of ketone to aster by treatment with per acid such as per acetic acid, MCPBA, per trifloroacetic acid etc.

- It is a redox reaction
- Cyclic ketones are converted to lectone with ring expention.

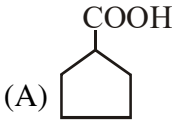
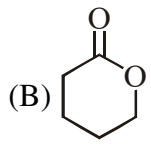
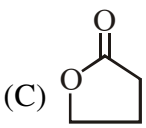
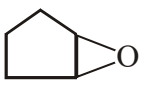


Mechanism

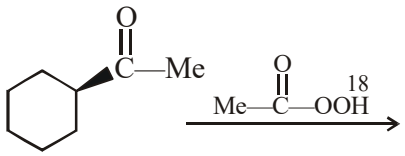


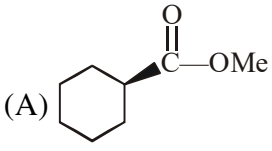
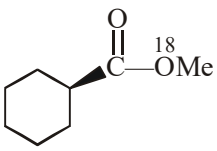
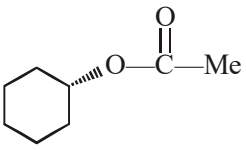
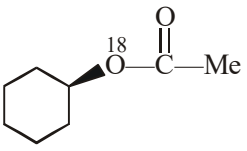
Note : In above reaction for shifting of groups migratory apptitude is applicable
Migratory order for above reaction
–H > 3º > 2º > –Ph > 1º > –Me

Q.1 Major product is :

(A)  (B)  (C)  (D) 

AR0081

Q.2  Major product is :

(A)  (B)  (C)  (D) 

AR0082

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ANSWER KEY

(1) CANNIZARO REACTION

Q.1 **Ans. (D)**

As $Cl_3C–CHO$ given chloroform

Q.2 **Ans. (C)**

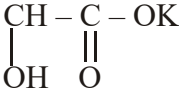
In crom cannizzaro reaction move reactive carbonyl compound is oxidised & less in reduced.

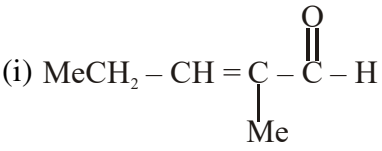
Q.3 **Ans. (B)**

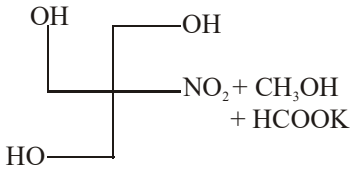
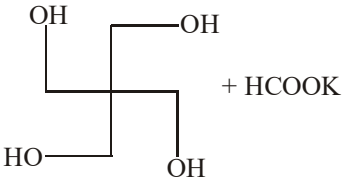
Intramoecular cannizzaro followed by heating effect

Q.4 **Ans.** (i) $CH_3OD + HCOONa$ (ii) $DCH_2OD + DCOONa$

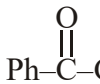
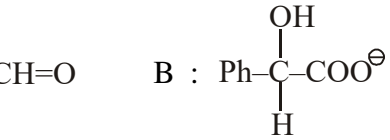
Q.5 **Ans.** (i) $PhCH_2OD + PhCOONa$ (ii) $Ph-CH_2OH + PhCO\overset{18}{O}Na$

Q.6 **Ans.** (i) $Ph–CH_2OH + HCOOK$ (ii) 

Q.7 **Ans.** (i)  (ii) $Me_2CH–CH_2OH + Me_2CHCOOK$

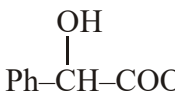
Q.8 **Ans.** (i)  (ii) 

Q.9 **Ans. (B)**

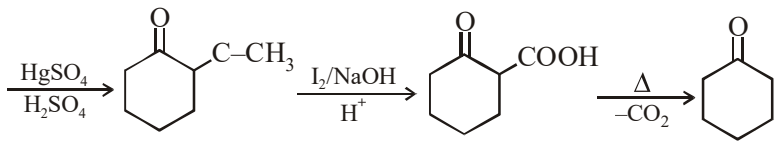
A :  B :  C :

Q.10 **Ans. (A)→S ; (B)→P ; (C)→Q ; (D)→R**

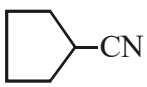
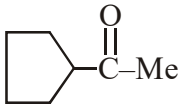
Q.11 **Ans. (A)**

A :  B : PhCOOH C :

Q.12 **Ans. (D)**



Q.13 **Ans.** (B)

Q.14 **Ans. (C)** A :  B : 

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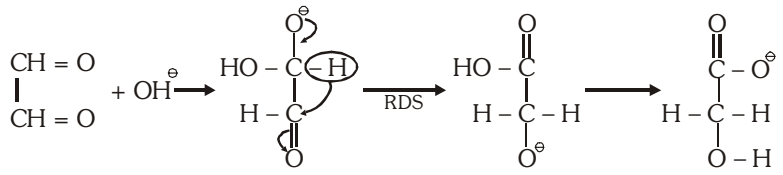
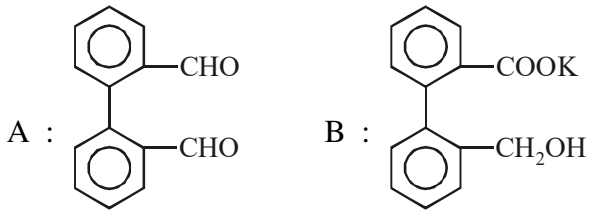
Q.15 **Ans.** (A)



option A is correct.

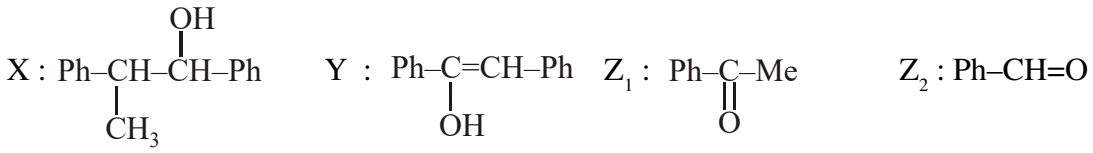
Q.16 **Ans. (B)**



Q.17 **Ans. (B)**

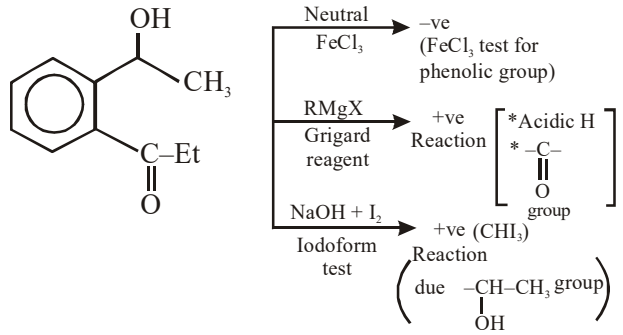
Cron cannizaro reaction

Q.18 **Ans. (A)**



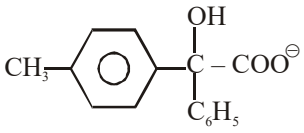
Q.19 Ans. (1)

Sol.

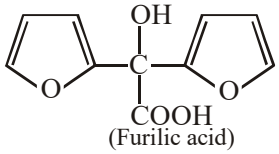


(2) BENZIL-BENZILIC REARRANGEMENT OR BENZILIC ACID REARRANGEMENT

1. **Ans.**

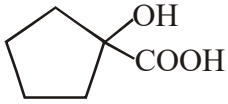


2. **Ans.**

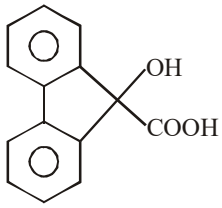


(Furilic acid)

3. **Ans.**



4. **Ans.**



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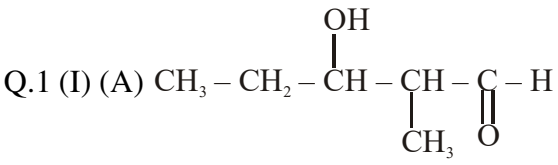
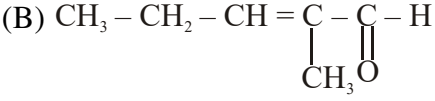
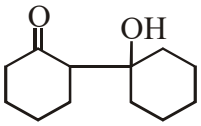
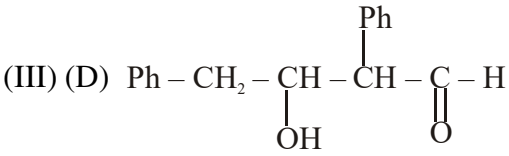
(3) ALDOL CONDENSATION

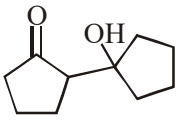
Q.1 **Ans.**

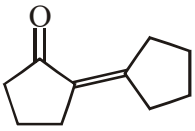
Q.1 (I) (A) 

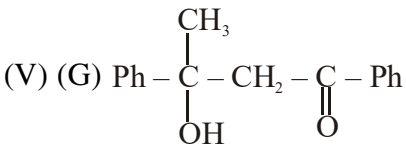
(B) 

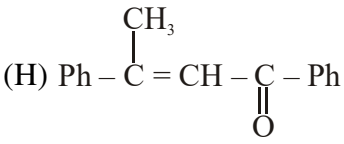
(II) (C) 

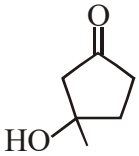
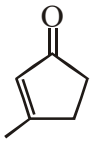
(III) (D) 

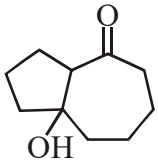
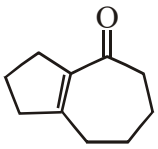
(IV) (E) 

(F) 

(V) (G) 

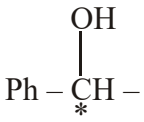
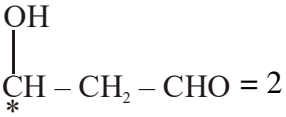
(H) 

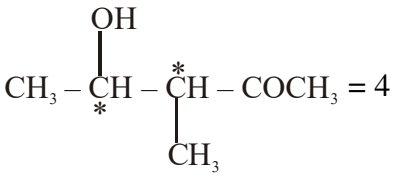
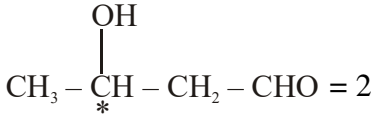
Q.2 **Ans.** (I) (A)  (B)  ;

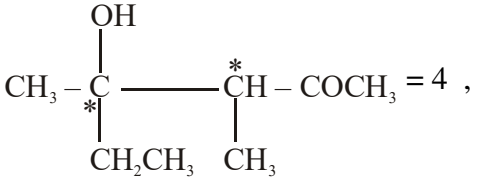
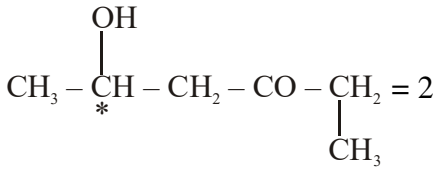
(II) (E)  (F) 

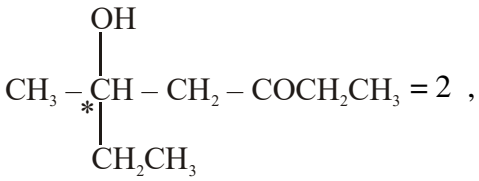
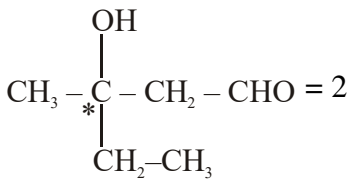
Q.3

Ans. **Excluding Stereo** **Including Stereo**

(I)  , 

(II)  

 , 

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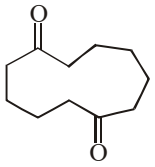
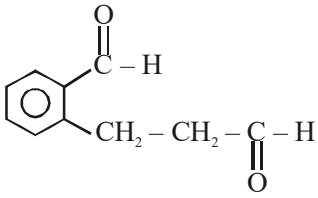
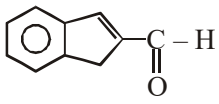
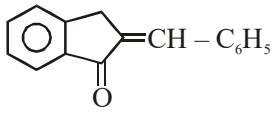
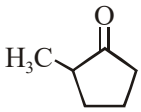
Q.4 **Ans.** (I)  (II) $CH_3 - \underset{\underset{O}{\|}}{C} - CH_3$

Q.5 **Ans.** (i) (a)  (b)  (ii) 

Q.6 **Ans.** (i) X =  $Y = CH_3 - \underset{\underset{O}{\|}}{C} - H$

(ii) $X = CH_3 - \overset{\overset{O}{\|}}{C} - CH_2 - CH_2 - \overset{\overset{O}{\|}}{C} - CH_3$ (iii) $X = CH_3 - \overset{\overset{O}{\|}}{C} - CH_2 - CH_2 - CH_2 - CHO$

Q.7 **Ans.** (C)

Intramolecular aldol condensation the 1,4-additon and finally clemmesion reduction.

Q.8 **Ans.** (D)

Q.9 **Ans. (B)**

Ozonolysis followed by intramolecular aldol.

Q.10 **Ans. (C)**

(A) $CH_3–\underset{\underset{OH}{|}}{CH}–Cl_2CHO$ (B) $CH_3CH=CH–CH=O$

(C) $CH_3CH_2CH_2CH_2OH$ (D) $CH_3CH_2CH_2COOH$

Q.11 **Ans.** (A)

Q.12 **Ans. (A)**

$$CH_3CHO + \overset{\ominus}{C}H_2 - CHO \longrightarrow CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - CHO \xrightarrow[-H_2O]{\Delta} CH_3 - CH = CH - CHO$$

$$CH_3(CH=CH)_3–CHO \xleftarrow[-H_2O]{\Delta} CH_3 - CH = CH - \underset{\underset{OH}{|}}{CH} - CH_2 - CH = \underset{\underset{CHO}{|}}{CH} \xleftarrow{\ominus CH_2–CH=CH-CHO\ ]}$$

Q.13 **Ans. (A)**

P : Q : Me–CH=O R : Me–CH=Ch–CH=O

Q.14 Ans. (1)

Sol. Aldehyde reacts at a faster rate than keton during aldol and stericall less hindered anion will be a better nucleophile so sefl aldol at $CH_3 - \overset{\overset{O}{\|}}{C} - H$ will be the major product.

Q.15 Ans. (4)

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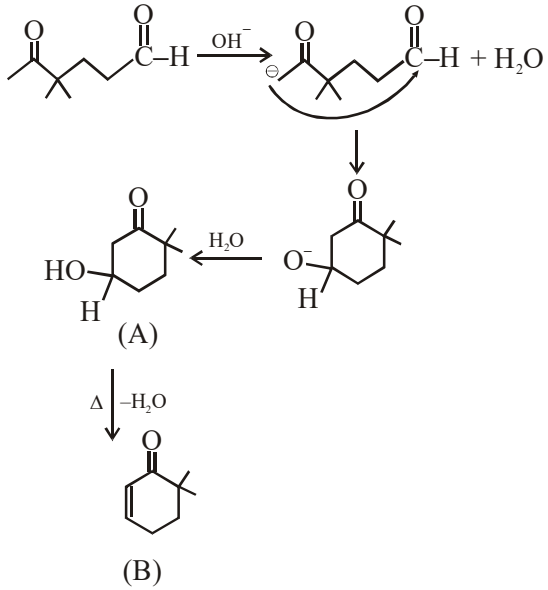
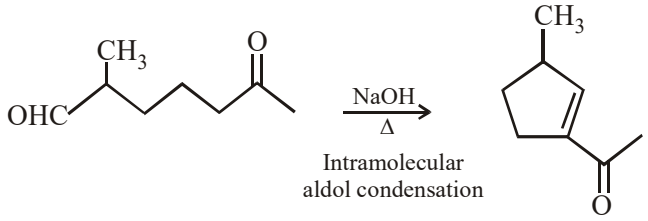
Q.16 Ans. (4)

Sol.



Q.17 Ans. (4)

Sol.



(4) HALOGENATION OF THE α-CARBON OF ALDEHYDES AND KETONES

Q.1 **Ans.** (1 , 2 , 5 , 7 ,8, 9 , 11)

Q.2 **Ans.** (i) $CH_3–COO^- + CHI_3$; (ii) $^-O–\overset{O}{\overset{\|}{C}}–\overset{O}{\overset{\|}{C}}–O^- + CHI_3$; (iii)

Q.3 **Ans. (A,B,C)**

Q.4 **Ans. (C)**

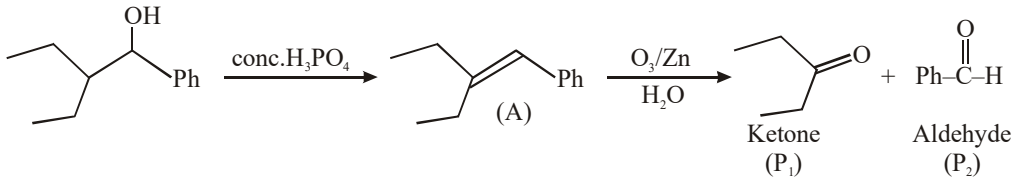
X : $PhCH_2CH_2OH$ Y : $PhCH_2CHO$ Z : $Ph–CH_2–CH=\underset{\underset{Ph}{|}}{C}–CHO$

Q.5 **Ans. (A)**

Q.6 **Ans. (A)**

$$C–C–\overset{O}{\overset{\|}{C}}–C \xrightarrow[I_2]{NaOH} CHI_3 + CH_3CH_2COONa \xrightarrow{H^\oplus} CH_3CH_2COOH$$

Q.7 **Ans.** (B)



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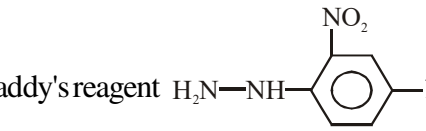
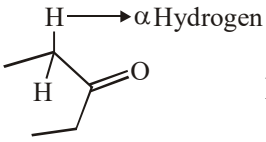
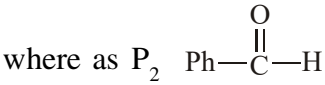
(A) Both ketone & aldehyde react with braddy's reagent  2, 4 dinitrophenyl hydrazine.

(B) With $NaHSO_3$ only aldehyde give crystalline bisulphite adduct whereas hindered ketone is unable react.

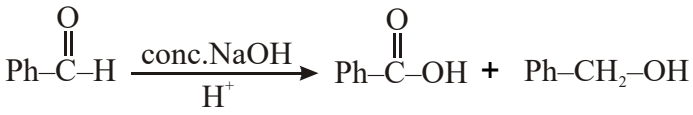
(C) $NaHCO_3$ will not react any of them.

(D) Both P_1 & P_2 are unable to form idoform with $NaOH/I_2$

Q.8 **Ans.** (A)

For aldol αH should be present i.e.  P_1 where as P_2  will give cannizaro's as there is no. αH in P_2.

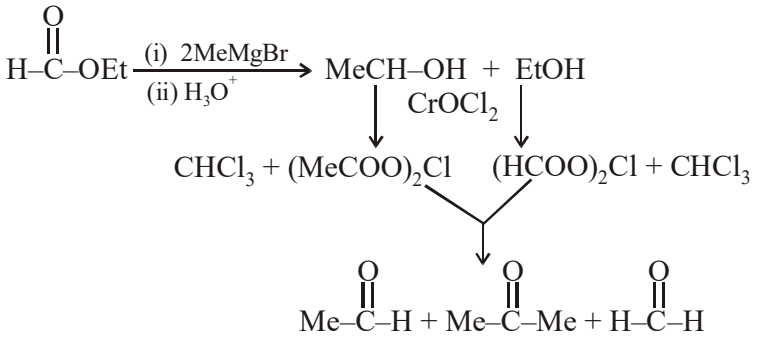
Q.9 **Ans.** (D)



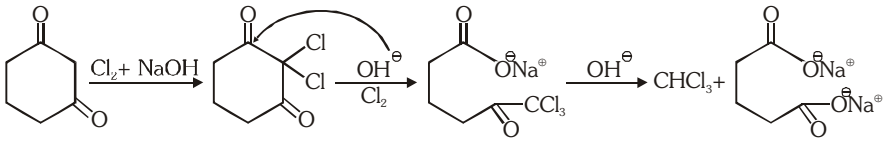
The above reaction is intermolecular redox reaction. In which desprotionation is taking place as a result of which 2 different products are formed from singlet reactant.

Q.10 **Ans.** (A,B,C,D)

Q.11 **Ans. (C)**



Q.12 **Ans. (A,B,D)**



Q.13 **Ans.** (A,B,C,D)

Q.14 **Ans. (A,B,C,D)**

Q.15. Ans. (4)

Sol. Seliwanoff's test is used to distinguished aldose and ketose group.

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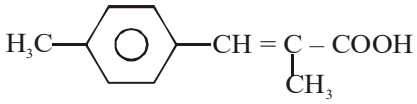
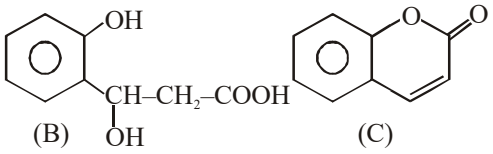
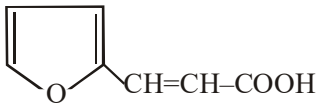
(5) PERKIN CONDENSATION

Q.1 **Ans.** 

Q.2 **Ans.** 
(B) (C)

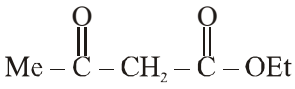
Q.3 **Ans.** 

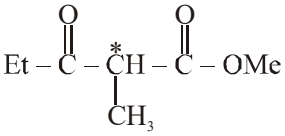
Q.4 Ans. (A)

Q.5 Ans. (C, D)

Q.6 Ans. (C)

(6) CLAISEN CONDENSATION

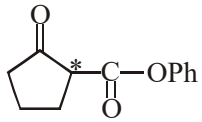
Q.1 **Ans.** 

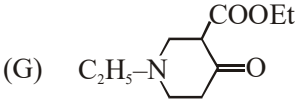
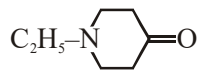
Q.2 Ans. 
(R / S)

Q.3 Ans. 4 products

Q.4 Ans. $C_6H_5COCH_2COOC_2H_5$, $CH_3COCH_2COOC_2H_5$
Ethtl benzolyacetate

Q.5 Ans.
Diethyl-α-oxalyphenyl acetate

Q.6 Ans. 
(R / S)

Q.7 Ans. (G)  , (H) 
1-Ethyl-4-piperiodone

(7) Beayer villiger oxidation

Q.1 Ans.(B)

Q.2. Ans.(D)

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