DPP (1) : Preparation of Carbonyl Compounds

1. On heating calcium propionate, the product formed is
(1) 3-Pentanone (2) 2-Pentanone (3) 3-Methyl-2-butanone (4) Propanone

2. A mixed salt of calcium acetate formate on dry distillation gives
(1) ethanal (2) methanal (3) propanone (4) All the three above.

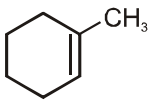
3. Acetic acid when heated (300ºC) with MnO_2 gives
(1) formaldehyde (2) acetaldehyde (3) acetone (4) butaone

4. In which of the following reaction ketone is formed :
(1) $CH_3–CH_2–OH \xrightarrow{KMnO_4/\overset{\oplus}{H}}$ (2) $CH_3–CH_2–OH \xrightarrow{Cu/\Delta}$
(3) $CH_3–\underset{\underset{CH_3}{|}}{CH}–OH \xrightarrow{Cu/\Delta}$ (4) $CH_3–\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}–OH \xrightarrow{Cu/\Delta}$

5. Ethylidene chloride on treatment with aq. KOH gives
(1) CH_3CHO (2) $CH_2OH.CH_2OH$ (3) HCHO (4) CHO. CHO

6. Benzene reacts with CH_3COCl in the presence of $AlCl_3$ to give
(1) C_6H_5COCl (2) C_6H_5Cl (3) $C_6H_5CH_3$ (4) $C_6H_5COCH_3$

7. Aldehydes can be prepared from acid chlorides by
(1) Clemmensen reduction (2) Wolff-kishner reduction
(3) Rosenmund's reduction (4) $LiAlH_4$ reduction.

8.  On reductive ozonolysis yields
(1) 6-oxoheptanal (2) 6-oxoheptanoic acid
(3) 6-hydroxyheptanal (4) 3-hydroxypentanal

DPP (2) : Nucleophlic Addition Reactions

1. The typical reaction of aldehydes and ketones is
(1) Nucleophilic substitution (2) Nucleophilic addition
(3) Electrophilic substitution (4) Electrophilic addition

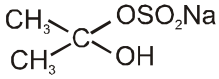
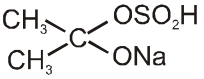
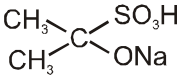
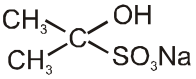
2. Ketones are less reactive than aldehydes because
(1) the + I-effect of the alkyl groups increases the electron deficiency of the carbonyl carbon
(2) the + I-effect of the alkyl groups decreases the electron deficiency of the carbonyl carbon
(3) of steric hindrance to the attacking nucleophile
(4) both (2) and (3) options are correct

3. Which gives nucleophilic addition most easily ?
(1) CH_3CHO (2) CH_3CH_2CHO (3) $CH_3–\underset{\underset{CH_3}{|}}{CH}CHO$ (4) HCHO

4. Which of the following is most reactive towards nucleophilic addition reactions ?
(1) CH_3COCH_3 (2) $CH_3CH_2COCH_2CH_3$ (3) $Ph–\overset{\overset{O}{\|}}{C}–CH_3$ (4) $Ph–\overset{\overset{O}{\|}}{C}–Ph$

5. $C_6H_5CHO \xrightarrow{HCN} X \xrightarrow{H^+/H_2O} Y$
In the above sequence, Y is
(1) Lactic acid (2) Mandelic acid (3) Malic acid (4) Cinnamic acid

6. Which of the following forms a stable hydrate ?
(1) CH_3COCH_3 (2) CH_3CHO (3) Cl_3CCHO (4) HCHO

7. The structure of the addition product formed when acetone reacts with a concentrated aqueous solution of sodium bisulphite is :
(1)  (2)  (3)  (4) 

8. Aldehydes react with alcohols in presence of dry HCl gas to form
(1) Aldols (2) Acetals (3) Ketals (4) None of these

9. Oximes are formed by the reaction of aldehydes and ketones with :
(1) NH_3 (2) NH_2NH_2 (3) NH_2OH (4) $NH_2CONHNH_2$

10. The compound which does not react with hydroxylamine is
(1) CH_3COOH (2) CH_3COCH_3 (3) CH_3CHO (4) HCHO.

11. The structure for acetaldehyde semicarbazone is :
(1) $CH_3CH = NCONHNH_2$ (2) $CH_3CH = NNHCONH_2$
(3) $CH_3CH = NOH$ (4) $CH_3CH = NNH_2$

12. Which gives addition reaction with aldehyde and ketone :
(1) $NH_2–NH_2$ (2) $NH_2NHCONH_2$ (3) $C_6H_5NHNH_2$ (4) HCN

13. Aldehyde with $NH_2–NH_2$ forms :
(1) hydrazones (2) aniline (3) nitrobenzene (4) none of these

14. Which functional group is formed by the reaction of primary amine with aldehyde:
(1) Amino (2) Imino (3) Nitro (4) Nitrito

15. Hydrolysis product which is formed by reaction between ketone and grignard reagent will be :
(1) $(CH_3)_3CHOH$ (2) C_2H_5OH (3) CH_3OH (4) None of these

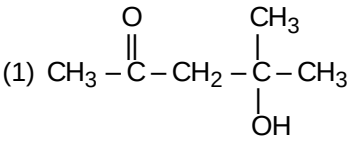
DPP (3) : Condensation Reactions

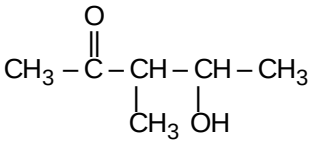
1. Aldol condensation is the characteristic reaction of
(1) all aldehydes and ketones.
(2) only those aldehydes and ketones which contain α-hydrogen atoms.
(3) only those aldehydes and ketones which do not contain α-hydrogen atoms.
(4) only aromatic aldehydes and ketones.

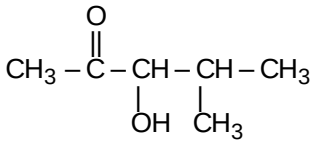
2. Which of the following compounds will undergo self aldol condensation in the presence of cold dilute alkali
(1) C_6H_5CHO (2) CH_3CHO (3) $HC\equiv C-CHO$ (4) $CH_2=CH-CHO$

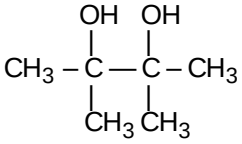
3. Base-catalysed aldol condensation will occur with
(1) Benzaldehyde (2) Propionaldehyde
(3) Formaldehyde (4) 2, 2-Dimethylpropionaldehyde.

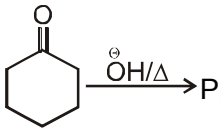
4. Which of the products is formed when acetone is reacted with barium hydroxide solution ?

(1) 

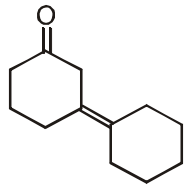
(2) 

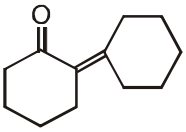
(3) 

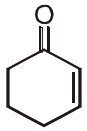
(4) 

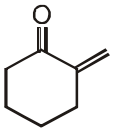
5. 

Product is :

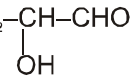
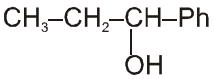
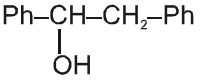
(1) 

(2) 

(3) 

(4) 

6. A $\xrightarrow{\overset{\ominus}{O}H/\Delta}$ $(CH_3)_2C=CHCOCH_3$ A is :
(1) Acetone (2) Acetaldehyde (3) Propionaldehyde (4) Formaldehyde

7. $Ph-CHO + CH_3-CHO \xrightarrow{\overset{\ominus}{O}H/\Delta}$ Product is:
(1) Ph –CH =CH– CHO (2)  (3)  (4) 

8. The reaction,
$C_6H_5CHO + (CH_3CO)_2O \xrightarrow[(ii)\ H^+/H_2O]{(i)\ CH_3COONa/453\ K} C_6H_5CH = CHCOOH + CH_3COOH$
is called
(1) Benzoin condensation (2) Aldol condensation
(3) Etard reaction (4) Perkin's reaction

DPP (4): Other Reactions

1. Cannizzaro's reaction is an example of
(1) Disproportionation reaction (2) Substitution reaction
(3) Elimination reaction (4) Addition reaction

2. Benzaldehyde, when heated with conc. KOH solution, gives
(1) $C_6H_5CH_2OH$ only (2) C_6H_5COOH only
(3) C_6H_5COOK only (4) a mixture of C_6H_5COOK and $C_6H_5CH_2OH$

3. The Cannizzaro's reaction is not given by :
(1) C_6H_5CHO (2) HCHO (3) CH_3CHO (4) $(CH_3)_3C–CHO$

4. Benzaldehyde is converted to benzyl alcohol by :
(1) Wurtz reaction (2) Cannizzaro reaction (3) Fittig reaction (4) Wurtz Fittig reaction

5. $OHC–CHO \xrightarrow{OH^-} HOH_2C–COOH$ The reaction is known as :
(1) Aldol condensation (2) Knovenagel reaction (3) Cannizzaro reaction (4) None of these

6. $Ph–CHO + HCHO \xrightarrow[\Delta]{KOH}$ (1) + (2) ; major products are :
(1) $Ph–CH_2OH + HCOO^{\ominus}K^{\oplus}$ (2) $Ph–COOH + CH_3OH$
(3) $Ph–CH(OH)–CH_3 + HCOO^{\ominus}K^{\oplus}$ (4) None of these

7. The only aldehyde which undergoes haloform reaction is
(1) Formaldehyde (2) Acetaldehyde (3) Benzaldehyde (4) Propionaldehyde

8. An optically active compound reacts with hydroxylamine to form an oxime and also gives a positive haloform test. What is the structure of the compound ?
(1) $CH_3CH_2CH(CH_3)COCH_3$ (2) $(CH_3)_2CHCH_2COCH_3$
(3) $CH_3CH_2CH_2COCH_2CH_3$ (4) $(CH_3)_2CHCOCH_2CH_3$

9. A compound with molecular formula, C_4H_8O gives a positive haloform test and a 2,4-DNP derivative. The compound is
(1) $CH_3CH_2CH_2CHO$ (2) $CH_3COCH_2CH_3$ (3) $(CH_3)_2CHCHO$ (4) All the above.

10. Which of the following compound does not give iodoform test .
(1) Pentanone -3 (2) Pentanone-2 (3) Propanone (4) Ethanol.

11. Acetaldehyde reacts with phosphorus pentachloride to form
(1) Acetyl chloride (2) Ethyl chloride (3) Ethylene chloride (4) Ethylidene chloride

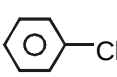
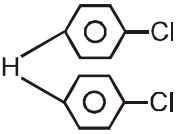
12. Formalin is an aqueous solution of
(1) Fluorescein (2) Formic acid (3) Formaldehyde (4) Furfuraldehyde

13. Which of the following reactions represent incorrect major product.

(1) $CHCl_3 + CH_3COCH_3 \longrightarrow CH_3-\underset{\displaystyle OH}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-CCl_3$ (Chloretone – hypnotic)

(2) $Ph.NH_2 + CHCl_3 + KOH \longrightarrow PhN \rightleftharpoons C$ (Bad Smell)

(3) $PhOH + CHCl_3 + NaOH \longrightarrow Ph–O–CH_3$

(4) $CCl_3–CH=O + 2$  $\xrightarrow{\text{Conc. } H_2SO_4} CCl_3–CH$  (DDT)

14. When $C_6H_5COCH_3$ reacts with NaOH and bromine, it gives :
(1) $CHBr_3$ (2) C_6H_5CONa
(3) $C_6H_5COONa + CHBr_3$ (4) CH_3COONa

15. Which of the following reagents converts both acetaldehyde and acetone to alkanes ?
(1) Ni/H_2 (2) $LiAlH_4$ (3) $I_2/NaOH$ (4) Zn–Hg/conc.HCl

DPP (5) : Lab Test

1. Tollen's reagent is not reduced by
(1) Formic acid (2) Acetaldehyde (3) Benzaldehyde (4) Acetic acid.

2. Aldehydes can be oxidised by
(1) Tollen's reagent (2) Fehling solution (3) Benedict solution (4) All.

3. Crotonaldehyde ($CH_3CH=CHCHO$) can be easily oxidised to crotonic acid ($CH_3CH=CHCOOH$) by using
(1) Alkaline $KMnO_4$ (2) Acidic $K_2Cr_2O_7$ (3) Tollen's reagent (4) HNO_3

4. Oxidation of compound X gives a product which reacts with phenylhydrazine but does not give a silver mirror test. Possible structure for X is
(1) CH_3CHO (2) CH_3CH_2OH (3) $(CH_3)_2CHOH$ (4) $CH_3CH_2CH_2OH$

5. Fehiling's solution is
(1) Acidified $CuSO_4$ solution
(2) Ammonical $CuSO_4$ solution
(3) Copper sulphate + sodium hydroxide + Rochelle salt
(4) Copper acetate + sodium citrate.

6. Which does not react with Fehling solution ?
(1) Acetaldehyde (2) Benzaldehyde (3) Butanal (4) Formic acid

7. Schiff's reagent is :
(1) Magenta solution decolourised with sulphurous acid
(2) Magenta solution decolourised with chlorine
(3) Ammonical cobalt chloride solution
(4) Ammonical manganese sulphate solution.

8. Acetaldehyde cannot show :
(1) Iodoform test (2) Lucas test (3) Benedict's test (4) Tollen's test

9. A compound gives a yellow precipitate on warming with iodine and aq. solution of NaOH. Its vapour density is 29. the compound is :
(1) CH_3CH_2CHO (2) CH_3COCH_3 (3) $CH_3CHOHCH_3$ (4) $CH_3CH_2CH_2OH$

DPP (6) : Prepartion of Carboxylic Acid (General)

1. Acetic acid is obtained when
(1) Methyl alcohol is oxidised with potassium permanganate
(2) Formaldehyde is oxidised with potassium dichromate and sulphuric acid
(3) Acetonitrile is hydrolysed with a dilute mineral acid
(4) Glycerol is heated with sulphuric acid.

2. In the following reaction sequence product Y is

$$C_2H_5Br \xrightarrow{KCN} X \xrightarrow[\text{Boil}]{\text{Dil. } H_2SO_4} Y$$

(1) Ethanol (2) Ethanal (3) Propanoic acid (4) Ethanenitrile

3. In the following reaction final product is :

$C_6H_5MgBr + CO_2 \xrightarrow{Ether} \xrightarrow{H^{\oplus}}$

(1) Benzoic acid (2) Benzaldehyde (3) Benzamide (4) Benzene

4. The acid D obtained through the following sequence of reactions is

$C_2H_5Br \xrightarrow{Alc.\ KOH} A \xrightarrow[CCl_4]{Br_2} B \xrightarrow[(excess)]{KCN} C \xrightarrow{H_3O^+} D$

(1) Succinic acid (2) Malonic acid (3) Maleic acid (4) Oxalic acid

5. Which of the following does not give benzoic acid on hydrolysis ?

(1) Phenyl cyanide (2) Benzoyl chloride (3) Benzyl chloride (4) Methyl benzoate

6. (Acetic anhydride) $\begin{matrix} CH_3—CO \\ CH_3—CO \end{matrix}\!\!>\!O$ on hydrolysis gives :

(1) $CH_3COOC_2H_5$ (2) CH_3COOH (3) C_2H_5OH (4) none of these

7. In which of the following reaction the final product is neither an acid nor an acid salt.

(1) $Ph–CHO \xrightarrow{Tollen's\ reagent}$ (2) $CH_3–CH_2–OH \xrightarrow{KMnO_4/\bar{O}H}$

(3) $Ph–CHO \xrightarrow{Fehling\ solution}$ (4) $Ph–CH_2–OH \xrightarrow{K_2Cr_2O_7/H^+}$

DPP (7) : Chemical reactions of Carboxylic Acid

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

(1) Acetic anhydride (2) Chloral (3) Trichloroacetic acid (4) Methyl chloride.

2. Which of the following will not undergo Hell-Volhard Zelinsky (HVZ) reaction ?

(1) HCOOH (2) CH_3COOH (3) CH_3CH_2COOH (4) $CH_3CHBrCOOH$.

3. Identify Z in the following reaction sequence

$CH_3I \xrightarrow[Ether]{Mg} X \xrightarrow[(ii)\ H_3O^+]{(i)\ Dry\ ice} Y \xrightarrow[Red\ P]{Cl_2} Z$

(1) CH_3COOH (2) CH_3MgI (3) CH_3COCl (4) $ClCH_2COOH$.

4. The reaction : $RCOOAg + Br_2 \xrightarrow{CCl_4,\ Reflux} R–Br + AgBr + CO_2$ is called

(1) Wurtz reaction (2) Hunsdiecker reaction
(3) Friedel-Crafts reaction (4) Kolbe's reaction

5. The reaction, $CH_3COOH + CH_3OH \xrightarrow{H^+} CH_3COOCH_3 + H_2O$ is called

(1) Acidification reaction (2) Dehydration reaction
(3) Dehydrogenation reaction (4) Esterification reaction

6. It is difficult to esterify $R_3C–COOH$ because of

(1) Steric hindrance (2) Delocalization
(3) Inductive effect of the R group (4) Hyperconjugation of the alkyl groups

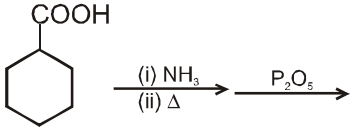
7. Which of the following is correct order of esterification of following acids with CH_3OH :

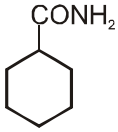
HCOOH , CH_3COOH , $CH_3–CH_2–COOH$, $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–COOH$

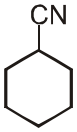
I II III IV

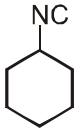
(1) I = II = III = IV (2) I > II > III > IV (3) I < II < III < IV (4) I > IV > III > II

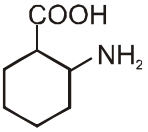
8. The product of the following reaction is :



(1) 

(2) 

(3) 

(4) 

9. Which of the following method is not used for the conversion of carboxylic acids into acid halides ?

(1) $RCOOH + SOCl_2 \longrightarrow$ (2) $RCOOH + PCl_5 \longrightarrow$

(3) $RCOOH + Cl_2 \longrightarrow$ (4) $RCOOH + PCl_3 \longrightarrow$

Answers

DPP (1)

1.	(1)	**2.**	(1)	**3.**	(3)	**4.**	(3)	**5.**	(1)	**6.**	(4)	**7.**	(3)
8.	(1)												

DPP (2)

1.	(2)	**2.**	(4)	**3.**	(4)	**4.**	(1)	**5.**	(2)	**6.**	(3)	**7.**	(1)
8.	(2)	**9.**	(3)	**10.**	(1)	**11.**	(2)	**12.**	(4)	**13.**	(1)	**14.**	(2)
15.	(1)												

DPP (3)

1.	(2)	**2.**	(2)	**3.**	(2)	**4.**	(1)	**5.**	(2)	**6.**	(1)	**7.**	(1)
8.	(4)												

DPP (4)

1.	(1)	**2.**	(4)	**3.**	(3)	**4.**	(2)	**5.**	(3)	**6.**	(1)	**7.**	(2)
8.	(1)	**9.**	(2)	**10.**	(1)	**11.**	(4)	**12.**	(3)	**13.**	(3)	**14.**	(3)
15.	(4)												

DPP (5)

1.	(4)	**2.**	(4)	**3.**	(3)	**4.**	(3)	**5.**	(3)	**6.**	(2)	**7.**	(1)
8.	(2)	**9.**	(2)										

DPP (6)

1.	(3)	**2.**	(3)	**3.**	(1)	**4.**	(1)	**5.**	(3)	**6.**	(2)	**7.**	(3)

DPP (7)

1.	(3)	**2.**	(1)	**3.**	(4)	**4.**	(2)	**5.**	(4)	**6.**	(1)	**7.**	(2)
8.	(2)	**9.**	(3)										