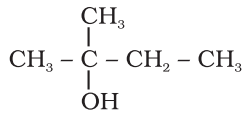
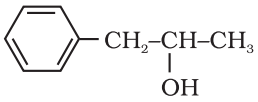
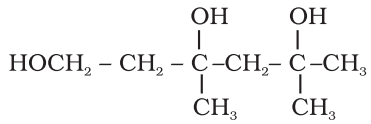
Answers to Some Questions in Exercises

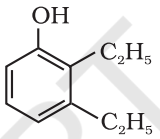
UNIT 7

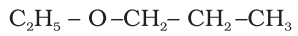
7.1 (i) 2,2,4-Trimethylpentan –3-ol (ii) 5-Ethylheptane –2, 4-diol
(iii) Butane –2,3-diol (iv) Propane –1,2,3,-triol
(v) 2- Methylphenol (vi) 4-Methylphenol
(vii) 2,5 – Dimethylphenol (viii) 2,6-Dimethylphenol
(ix) 1-Methoxy-2-methylpropane (x) Ethoxybenzene
(xi) 1-phenoxyheptane (xii) 2 –Ethoxybutane

7.2 (i) 

(ii) 

(iii) 

(iv) 

(v) 

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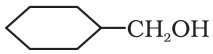
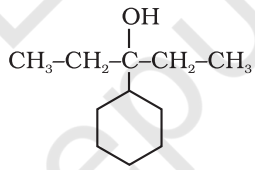
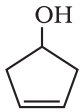
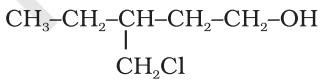
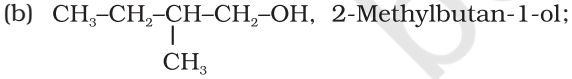
(vii) 

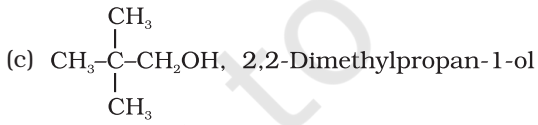
(viii) 

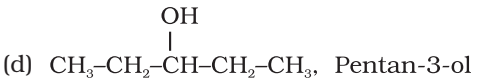
(ix) 

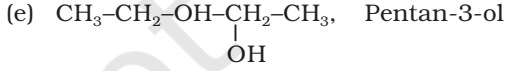
(x) 

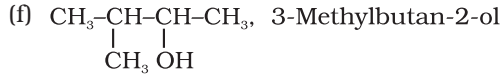
7.3 (i) (a) $CH_3CH_2CH_2CH_2CH_2OH$, Pentan-1-ol;

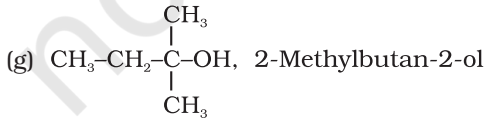
(b) 
2-Methylbutan-1-ol;

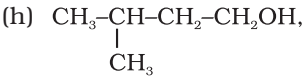
(c) 
2,2-Dimethylpropan-1-ol

(d) 
Pentan-3-ol

(e) 
Pentan-3-ol

(f) 
3-Methylbutan-2-ol

(g) 
2-Methylbutan-2-ol

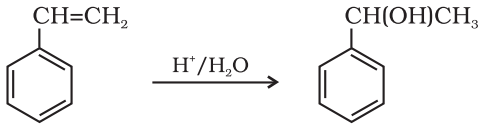
(h) 
3-Methylbutan-1-ol

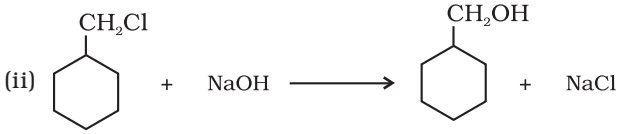
7.4 Hydrogen bonding in propanol.

7.5 Hydrogen bonding between alcohol and water molecules.

7.8 o-Nitrophenol is steam volatile because of intramolecular hydrogen bonding.

7.12 **Hint:** Carryout sulphonation followed by nucleophilic substitution.

7.13 (i) 

(ii) 

(iii) $CH_3(CH_2)_4Cl + NaOH \longrightarrow CH_3(CH_2)_4OH + NaCl$

7.14 Reaction with (i) sodium and (ii) sodium hydroxide

7.15 Due to electron withdrawing effect of nitro group and electron releasing effect of methoxy group.

7.20 (i) Hydration of Propene.

(ii) By nucleophilic substitution of –Cl in benzyl chloride using dilute NaOH.

(iii) $C_2H_5MgBr + HCHO \rightarrow C_2H_5CH_2OMgBr \xrightarrow{H_2O} C_2H_5CH_2OH$

(iv) $CH_3MgBr + CH_3COCH_3 \longrightarrow CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-OMgBr \xrightarrow{H_2O} CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-OH$

7.23 (i) 1-Ethoxy-2-methylpropane.

(ii) 2-Chloro-1-methoxyethane.

(iii) 4-Nitroanisole.

(iv) 1-Methoxypropane.

(v) 1-Ethoxy-4,4-dimethylcyclohexane.

(vi) Ethoxybenzene.

UNIT 8

8.2 (i) 4-Methylpentanal

(ii) 6-Chloro-4-ethylhexan-3-one

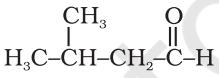
(iii) But-2-enal

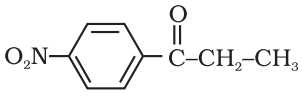
(iv) Pentane-2,4-dione

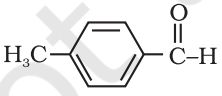
(v) 3,3,5-Trimethylhexan-2-one

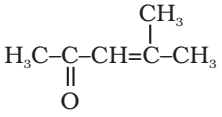
(vi) 3,3-Dimethylbutanoic acid

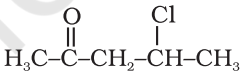
(vii) Benzene –1,4-dicarbaldehyde

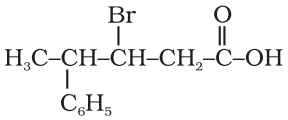
8.3 (i) 

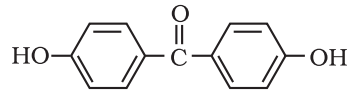
(ii) 

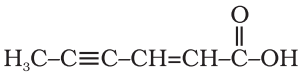
(iii) 

(iv) 

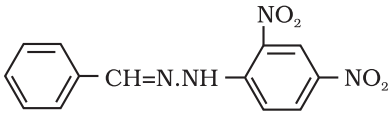
(v) 

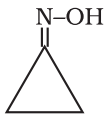
(vi) 

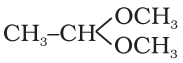
(vii) 

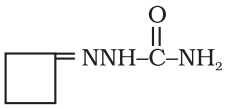
(viii) 

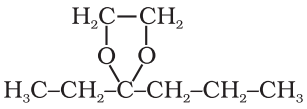
8.4 (i) Heptan-2-one (ii) 4-Bromo-2-methylhexanal (iii) Heptanal
(iv) 3-Phenylprop-2-enal (v) Cyclopentanecarbaldehyde (vi) Diphenylmethanone

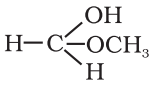
8.5 (i) 

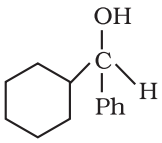
(ii) 

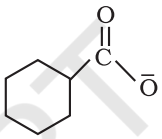
(iii) 

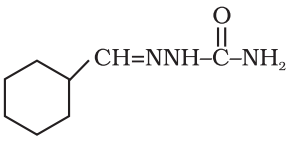
(iv) 

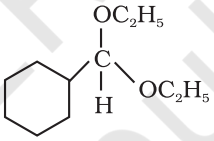
(v) 

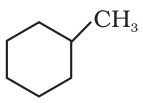
(vi) 

8.6 (i) 

(ii) 

(iii) 

(iv) 

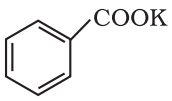
(v) 

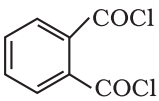
8.7 (ii), (v), (vi), (vii): Aldol condensation. (i), (iii), (ix) Cannizaro reaction. (iv), (viii) Neither.

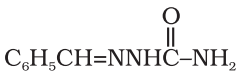
8.10 2-Ethylbenzaldehyde (draw the structure yourself).

8.11 (A) $CH_3CH_2CH_2COOCH_2CH_2CH_2CH_3$, butyl butanoate.
(B) $CH_3CH_2CH_2\ COOH$ (C) $CH_3CH_2CH_2CH_2OH$. Write equation yourself.

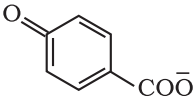
8.12 (i) Di-tert-butyl ketone < Methyl tert-butyl ketone < Acetone < Acetaldehyde
(ii) $(CH_3)_2CHCOOH$ < $CH_3CH_2CH_2COOH$ < $CH_3CH(Br)CH_2COOH$ < $CH_3CH_2CH(Br)COOH$
(iii) 4-Methoxybenzoic acid < Benzoic acid < 4-Nitrobenzoic acid < 3,4-Dinitrobenzoic acid.

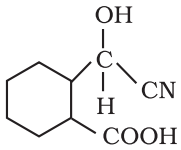
8.17 (i) 

(ii) 

(iii) 

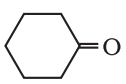
(iv) $C_6H_5COCl–AlCl_3$

(v) 

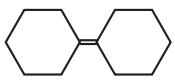
(vi) 

(vii)  + other products

(viii) $CH_3CH(OH)CH_2COOC_2H_5$

(ix) 

(x) 1. BH_3; 2. $H_2O_2/\bar{O}H$; 3. PCC

(xi) 

8.19 The compound is methyl ketone and its structure would be: $CH_3COCH_2CH_2CH_3$

UNIT 9

9.1 (i) 1-methylethylamine or propan-2-amine (ii) Propan-1-amine
(iii) N-methyl-2-methylethylamine or N-methylpropan-2-amine (iv) 2-methylpropan-2-amine
(v) N-methylbenzenamine or N-methylaniline (vi) N-Ethyl-N-methylethanamine
(vii) 3-Bromoaniline or 3-Bromobenzenamine

9.4 (i) $C_6H_5NH_2 < C_6H_5NHCH_3 < C_2H_5NH_2 < (C_2H_5)_2NH$
(ii) $C_6H_5NH_2 < C_6H_5N(CH_3)_2 < CH_3NH_2 < (C_2H_5)_2NH$
(iii) (a) p-nitroaniline < aniline < p-toluidine
(b) $C_6H_5NH_2 < C_6H_5NHCH_3 < C_6H_5CH_2NH_2$
(iv) $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$ (v) $(CH_3)_2NH < C_2H_5NH_2 < C_2H_5OH$
(vi) $C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2$