Answers to Some Questions in Exercises

7.1 (i) 2,2,4-Trimethylpentan –3-ol

(iii) Butane -2,3-diol

(v) 2- Methylphenol

(vii) 2,5 - Dimethylphenol

(ix) 1-Methoxy-2-methylpropane

(xi) 1-phenoxyheptane

(iii)
$$HOCH_2 - CH_2 - C - CH_2 - C - CH_3 - CH_3$$

(v) $C_2H_5 - O - CH_2 - CH_2 - CH_3$

7.3 (i) (a) CH₂CH₂CH₂CH₂CH₂OH, Pentan-1-ol;

(b) $CH_3-CH_2-CH-CH_2-OH$, 2-Methylbutan-1-ol; CH_3

(c)
$$CH_3$$
 (c) CH_3 -C-CH $_2$ OH, 2,2-Dimethylpropan-1-ol CH_3

(e) CH_3 - CH_2 -OH- CH_2 - CH_3 , Pentan-3-ol OH

CH
$$_3$$
 | CH $_3$ -CH $_2$ -C-OH, 2-Methylbutan-2-ol CH $_3$

7.4 Hydrogen bonding in propanol.

UNIT 7

(ii) 5-Ethylheptane –2, 4-diol

(iv) Propane -1,2,3,-triol

(vi) 4-Methylphenol

(viii) 2,6-Dimethylphenol

(x) Ethoxybenzene

(xii) 2 -Ethoxybutane

(iv)
$$C_2H_5$$

X) CH₃-CH₂-CH-CH₂-CH₂-OH | | CH₂Cl

(f) CH_3 -CH-CH- CH_3 , 3-Methylbutan-2-ol CH_3 OH

(h)
$$CH_3$$
– CH - CH_2 – CH_2 OH, CH_3 3-Methylbutan-1-ol

- **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)
$$H^+/H_2O$$
 $CH(OH)CH_3$

(ii)
$$CH_2CI$$
 CH_2OH + NaOH CH_2OH

- (iii) $CH_3(CH_2)_4C1 + NaOH \longrightarrow CH_3(CH_2)_4OH + NaCl$
- 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)
$$CH_3MgBr + CH_3COCH_3 \longrightarrow CH_3 - COMgBr \xrightarrow{H_2O} CH_3 - COH_3 \longrightarrow CH_3 \longrightarrow$$

- **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
 - (iii) But-2-enal
 - (v) 3,3,5-Trimethylhexan-2-one
 - (vii) Benzene -1,4-dicarbaldehyde

(iii)
$$H_3C$$
 \longrightarrow $C-H$

- (ii) 6-Chloro-4-ethylhexan-3-one
- (iv) Pentane-2,4-dione
- (vi) 3,3-Dimethylbutanoic acid

(ii)
$$O_2N$$
—

O

C-CH₂-CH₃

Chemistry 304

(viii) H₃C-C≡C-CH=CH-C-OH

- **8.4** (i) Heptan-2-one
- (ii) 4-Bromo-2-methylhexanal
- (iii) Heptanal

- (iv) 3-Phenylprop-2-enal
- (v) Cyclopentanecarbaldehyde
- (vi) Diphenylmethanone

$$\mathbf{8.5} \qquad \text{(i)} \qquad \begin{array}{c} \text{NO}_2 \\ \text{CH=N.NH} \\ \end{array} \qquad \begin{array}{c} \text{NO}_2 \\ \text{NO}_2 \\ \end{array}$$

(ii) N-OH

(iii)
$$CH_3$$
- CH $< {OCH_3 \atop OCH_3}$

(ii)
$$\bigcap_{C}$$
 \overline{Q}

(iii)
$$CH=NNH-C-NH$$

$$\text{(iv)} \quad \overbrace{ \begin{array}{c} \text{OC}_2\text{H}_5 \\ \text{I} \\ \text{OC}_2\text{H}_5 \\ \end{array} }^{\text{OC}_2\text{H}_5}$$

(v)
$$CH_3$$

- 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) CH₂CH₂COOCH₂CH₂CH₂CH₃, butyl butanoate.
 - (B) CH₂CH₂CH₂COOH (C) CH₂CH₂CH₂CH₂OH. Write equation yourself.
- 8.12 (i) Di-tert-butyl ketone < Methyl tert-butyl ketone < Acetone < Acetaldehyde
 - (ii) $(CH_3)_2CHCOOH < CH_3CH_2COOH < CH_3CH(Br)CH_2COOH < CH_3CH_2CH(Br)COOH$
 - (iii) 4-Methoxybenzoic acid < Benzoic acid < 4-Nitrobenzoic acid < 3,4-Dinitrobenzoic acid.

OH

(iv) C₆H₅COCl-AlCl₃

$$(v)$$
 COO

(vii)
$$C_6H_5CH=C-CHO + other$$
 products CH_5

8.19 The compound is methyl ketone and its structure would be: CH₂COCH₂CH₂CH₃

305 Answers...

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) $C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2$

Chemistry 306



