ORGANIC CHEMISTRY-II

(Common with B.Sc. Biotechnology, Industrial Microbiology : Part - III)
Semester-III

Time : Three Hours] [Maximum Marks : 35

Note : Attempt two questions each from Section A and B carrying 7 marks each, and the entire Section C consisting of 7 short answer type questions carrying 1 mark each.

Section-A

I. (a) Discuss at least two methods by which primary, secondary and tertiary alcohols can be distingished.

(b) Explain why acid catalysed dehydration of tert, butyl alcohol occurs faster than n-butyly alcohol. 5,2

II. (a) How is Glycerol react with the following :
(i) Excess of HI. (ii) Oxalic acid at 383K and 503K. (iii) $KHSO^4$.

(b) Discuss the mechanism of Pinacol-Pinacolone rearrangement. 4,3

III. (a) Ortho and Para Nitro-phenols are more acidic than m-Nitrophenol. Explain.

(b) Discuss the mechanism of Reimer-Tiemann reaction. 4,3

IV. (a) Phemol + $C_2H_5COCl \rightarrow A \xrightarrow{AlCl_3, CS_2} B + C$ What are A, B and C ? What familiar rearrangement is involved in the formation of B and C from A ? Give its accepted mechanism.

(b) Give the mechanism of Gattermann synthesis. 4,3

Section-B

V. What is Aldol condensation ? Discuss the mechanism of acid and base catalysed Aldol condensation reactions. What is the important difference between the two ? Illustrate your answer with examples. 7

VI. (a) What are Acetals ? Explain, giving an example, how they can be used as protecting group. 4,3

(b) Write a note on Mannich reaction.

VII. (a) Discuss the mechanism of the following :
(i) Benzoin condensation. (ii) Knovenagel condensation.

(b) α-hydrogens of carbonyl compounds are acidic while β-hydrogens are not. Explain. 5,2

VIII. (a) Write a note on Witting reaction.

(b) Complete the following reactions :
(i) C_6H_5CHO + Conc. NaOH → (ii) $C_6H_5COCH_3 + Cl_2$ (excess) + NaOH $\xrightarrow{\text{(i) }\Delta}$

(iii) $C_6H_5COCH_3 + NH_2NH_2 \xrightarrow{KOH, \Delta}$ (iv) $CH_3COCH_3 + NaOI \rightarrow$ 3,4

Section-C

IX. Explain briefly :

(a) Why formaldehyde does not respond to Aldol condensation ?
(b) How will you distinguish between 2-Pentanone and 3-Pentanone ?
(c) Aldehyde reduce Fehling solution but Ketones do not. Explain.
(d) What happens when Ethylene gycol is treated with $P + I_2$ or HI ?
(e) How is Glycol obtained from Propylene.
(f) Out of Phenol and Ethanol which is more acidic, and why ?
(g) What happens when Phenol is heated with Phthalic Anhydride in the presence of cone. H_2SO_4 acid ? $7x1=7$