

ORGANIC CHEMISTRY - B

(Common with B.Sc. Bio-Technology, Industrial Microbiology)

Time : Three Hours]

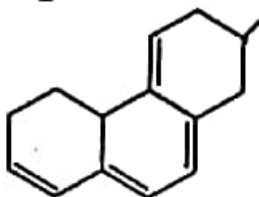
[Maximum Marks : 35

Note : Attempt two questions each from Section A and B carrying 7 marks each. Section C is compulsory

consisting of 7 short answer type questions carrying 1 mark each.

Section - A

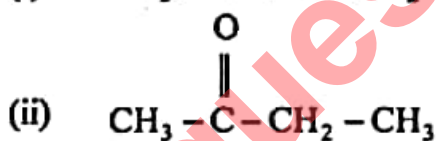
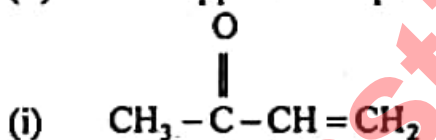
1. (a) Discuss various possible electronic excitations in an organic compound.
- (b) What do you mean by Bathochronic and Hypsochronic shifts ?
- (c) What are ausochromes and chromophores ? (3,2,2)
2. (a) Computer λ_{\max} for the following :



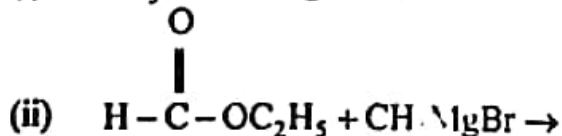
3. (b) Briefly mention the principle of UV spectroscopy.
- (c) Mention the application of UV spectroscopy. (3,2,2)
4. (a) What do you mean by spin-spin coupling during NMR spectroscopy ?
- (b) What is chemical shift ?
- (c) Mention the reasons for taking TMS as reference compound for obtaining $^1\text{H-NMR}$ spectrum. (3,2,2)
5. (a) An organic compound having molecular formula $\text{C}_5\text{H}_{10}\text{O}$ gave the following spectrochemical data :
 UV : $\lambda_{\max} = 278 \text{ nm}$
 IR : $2960 - 2850 \text{ (cm)}, 1718 \text{ (s)}, 1460 \text{ (j)} \text{ cm}^{-1}$
 $^1\text{H-NMR}$: (i) $\delta 1.1, \text{d}, 6\text{H}$
 (ii) $\delta 2.1, \text{s}, 3\text{H}$
 (iii) $\delta 2.45, \text{Septet}, 1\text{H}$

Deduce the structure of organic compound.

6. (b) What is Coupling constant and what is its importance ? (5,2)
7. (a) Which type of molecular nitrations can be observed while taking IR spectrum of a compound ?
- (b) For the purpose of interpretation, IR spectrum is divided into two regions, explain about them.
- (c) Give approximate positions of characteristic absorption bands of the following ketones :



8. (a) Give the reactions of n-butyl lithium with α, β unsaturated ketone.
- (b) (i) $\text{CH}_3\text{CN} + \text{RMgX} \rightarrow$



Complete the above reactions.

9. (c) Give two methods of preparation of organo zinc compounds (3,2,2)
- (a) What are Mercaptan ? Give two general methods of their formation.

- (b) Give the reaction of benzoic acid with
 (i) NaCN (ii) Br₂/FeBr₃.
- (c) How does oxidation reaction of thiol differ from oxidation reaction of alcohols. (3,2,2)
8. (a) A compound X has molecular formula C₇H₆O₂. It gives an IR absorption band at 1701 cm⁻¹. On treatment with LiAlH₄, it is converted into B that shows characteristic absorption band at 3300 cm⁻¹ and 1050 cm⁻¹. Assign structural formulae to A and B.
- (b) Complete the reactions :
- (i) $R - MgX + \frac{1}{2}O_2 \rightarrow$
- (ii) $CH_3MgI + CS_2 \rightarrow$
- (c) What are sulphonamides ? How are they prepared ? (3,2,2)

Section - C
(Compulsory Question)

9. Write in brief :
- (a) What do you mean by hyperchromic effect ?
- (b) Which of the following absorbs and which does not absorb UV radiations :
 (i) Benzene. (ii) n-hexane.
- (c) What is the effect of hydrogen bonding on position of peak or absorption bands during IR spectroscopy ?
- (d) What do you mean by shielding of protons during ¹H-NMR spectroscopy ?
- (e) What is the role of ether during preparation of Grignard's reagent ?
- (f) Out of carboxylic acids and sulphonic acids, which one is stronger acid and why ?
- (g) C-S-C bond angle in thioether is greater or lesser than C-O-C bond angle in ether. explain. (1×7=7)