(i) Printed Pages: 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 1 7 4 5 2

Exam. Code : 0 0 0 5

B.A./B.Sc. (General) 5th Semester

(2124)

CHEMISTRY

(Same for B.Sc. Microbial & Food Technology)

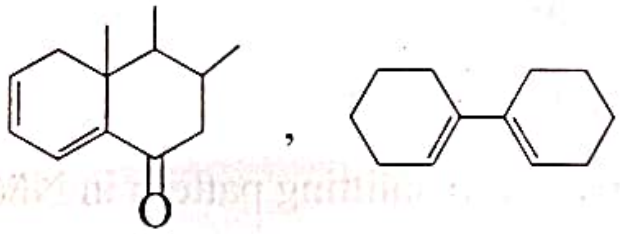
Paper—XVIII : Organic Chemistry—A

Time Allowed : Three Hours] [Maximum Marks : 22

Note :—Attempt **FIVE** questions in all, including Question No. 9 which is compulsory and selecting **ONE** question each from Units I–IV.

UNIT—I

1. (a) Using Woodward-Fieser rules (UV), calculate λ_{max} for the following compounds :



(b) Explain hyperchromic shift. 3,1

2. (a) Why increase in the polarity of the solvent shifts $\pi \rightarrow \pi^*$ bands to longer wavelength however $n \rightarrow \pi^*$ and $n \rightarrow \sigma^*$ to shorter wave-lengths in Ultraviolet (UV) absorption spectroscopy.

(b) Differentiate between chromophore and auxochrome. 3,1

UNIT—II

3. Predict the structure of the compound consistent with the following data (with explanation) :

Molecular Formula : $C_9H_{10}O_2$

UV : λ_{max} = 268, 264, 262, 257 nm

IR : 1745 (s), 1225 (br s), 749 (s) and 697 (s) cm^{-1}

^{1}H-NMR : ($CDCl_3$) : δ 1.96 (singlet, 3H), 5.00 (singlet, 2H), 7.22 (singlet, 5H). 4

4. (a) How will you distinguish between the *m*-chloro benzyl alcohol and *m*-chloro benzoic acid using IR spectroscopy ?

(b) Give the characteristic absorption bands in the infra-red spectra of benzaldehyde and benzamide. 2,2

UNIT—III

5. (a) Explain the following in NMR spectroscopy with appropriate examples :

(i) Chemical shift

(ii) Deshielding of protons.

(b) Predict the signals with splitting pattern in NMR spectrum of acetophenone and 1, 1, 2-tribromoethane. 2,2

6. Discuss the spin-spin splitting in NMR spectroscopy and predict the signals with splitting pattern in NMR spectrum of the following :

(i) Ethyl bromide

(ii) Ethanol. 4

UNIT—IV

7. (a) Describe the mechanism of mutarotation.

   (b) Illustrate the chain shortening of aldoses. 2,2

8. (a) Elaborate the mechanism of osozone formation.

   (b) Explain glycosides. How they can be formed ? 2,2

(Compulsory Question)

9. (a) Define Beer-Lambert Law.

   (b) Explain the types of stretching vibrations in infrared spectroscopy.

   (c) What is coupling constant and depict its role in isomerism ?

   (d) Describe the structure of ribose and deoxyribose.

$4 \times 1.5 = 6$