

B.A./B.Sc. (General) 5<sup>th</sup> Semester

1128

## CHEMISTRY

(Same for B.Sc. Microbiology and Food Technology)

Paper-XVIII (Organic Chemistry—A)

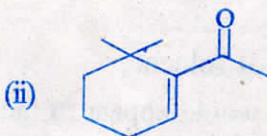
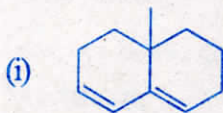
Time Allowed : Three Hours]

[Maximum Marks : 22

**Note :—** Attempt **five** questions in all, choosing one question from each unit and Question No. **9** is compulsory.

## UNIT-I

1. (a) Explain the effect of conjugation on  $\lambda_{\max}$  in UV Spectroscopy with examples. 2
- (b) Using Woodward Fieser rules, calculate the absorption maxima of the following compounds :



1,1

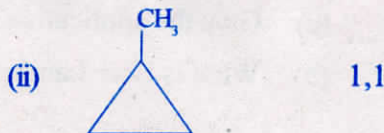
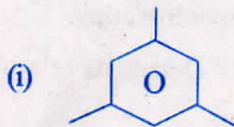
2. (a) Give the application of UV Spectroscopy. 2
- (b) What is Beer Lamberts Law ? Derive its relation. 2

## UNIT-II

3. (a) Explain the factors on which vibrational frequencies of a molecule depends give examples. 2
- (b) How would you distinguish between the following pairs of compounds on the basis of IR Spectrum :
- (i) Cis and trans cinnamic acid
- (ii) Ethanol and diethyl ether. 1,1
4. (a) (i) Write short note on Fermi Dirac resonance. 1
- (ii) How would you distinguish between aliphatic and aromatic ketone. 1
- (b) Deduce the structure of the compound having molecular formula  $C_3H_7NO$  having the following spectroscopic data :
- UV ( $\lambda_{max}$ ) : 238 nm
- IR : 3428 (m), 2494–2857 (w), 1681 (s), 1452 (m)  $cm^{-1}$
- NMR :  $\tau = 1.87$  singlet 1H ;  $\tau = 7.30$  singlet 3H. 2

## UNIT-III

5. (a) What is meant by term chemical shift ? Name the factors on which the value of chemical shift depends and discuss any one in detail. 2
- (b) Write short notes on :
- (i) Spin Spin Coupling
- (ii) Deuterium Exchange. 2
6. (a) Explain the PMR Spectra of Toluene. 2
- (b) How many NMR signals would appear in the following compounds and label the equivalent protons :



## UNIT—IV

7. (a) How would you determine the ring size of monosaccharides ? 2
- (b) Give mechanistic details of Rihani Fisher synthesis. 2
8. (a) Draw the Fisher projection and Haworth projection of lactose. 2
- (b) Glucose and fructose both give the same osazone on treatment with excess of phenyl hydroxine. Explain and give mechanism. 2

### (Compulsory Question)

9. (i) What is mutarotation ? Give example.
- (ii) What are reducing sugars ? Give one reaction of reducing sugars.
- (iii) Why absorption maximum of Homoannular diene is more than that of Heteroannular diene in U.V. Spectra ?
- (iv) Why is TMS used as standard reference in NMR Spectroscopy ?
- (v) Give characters of solvent used in visible and UV Spectroscopy.
- (vi) What is Bathochromic shift ? Give an example.  $6 \times 1 = 6$