

Exam. Code: 0005
Sub. Code: 0452

2021
B.A./B.Sc. (General) Fifth Semester
Chemistry
Paper – XVIII: Organic Chemistry – A
(Same for B. Sc. Microbial and Food Technology)

Time allowed: 3 Hours

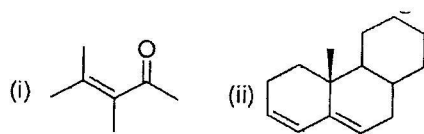
Max. Marks: 22

NOTE: Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I- IV.

X-X-X

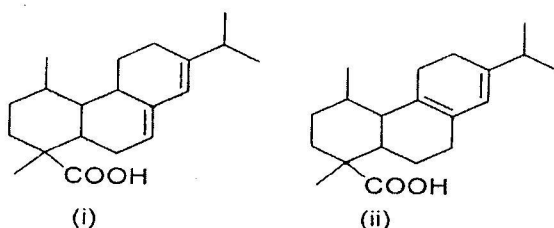
UNIT – I

- I. a) Calculate the λ_{\max} of the UV spectrum of the following compounds

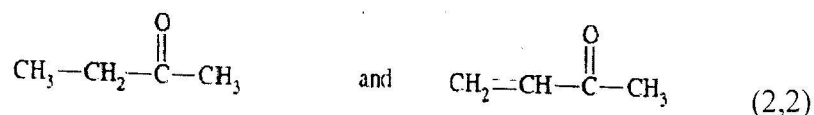


- b) What will be the effect on the peaks in the UV spectrum of benzene while changing the solvent from hexane to methanol. Account for this change? (2,2)

- II. a) Use Woodward Fieser rules to calculate the λ_{\max} of the UV spectrum of the following isomeric acids:

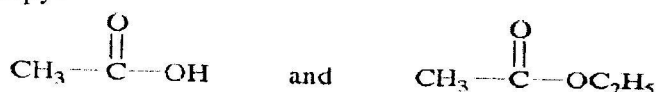


- b) Amongst following compounds, which will show absorption at higher wavelength and why?



UNIT – II

- III. a) How will you distinguish following two compounds on the basis of IR spectroscopy?



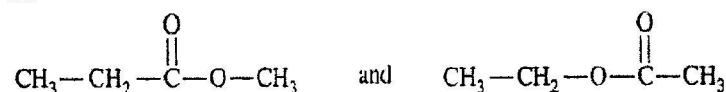
P.T.O.

(2)

- b) IR spectrum of a compound with molecular formula C_4H_8O shows strong absorption at 1070 cm^{-1} and 2900 cm^{-1} but no absorption is observed at 1600 cm^{-1} . Determine the structure with explanation. (2,2)
- IV. a) How will you distinguish between o-hydroxybenzoic acid and m-hydroxybenzoic acid on the basis of IR spectroscopy?
- b) What is the effect of conjugation and hydrogen bonding absorption frequency of particular group? (2,2)

UNIT – III

- V. a) Why signals in PMR spectrum undergo splitting? Explain in detail.
- b) In ^1H NMR spectrum of a compound with molecular formula $C_9H_{10}O_2$ shows three signals were obtained at δ 7.22, 5.0 and 2.0 with intensity ratio 5:2:3 respectively. Identify the structure of the compound. (2,2)
- VI. a) Explain terms (i) coupling constant (ii) nuclear magnetic resonance
- b) How is PMR spectroscopy helpful in distinguishing following isomeric compounds?



(2,2)

UNIT – IV

- VII. a) What are the limitations of open chain structure of D-glucose? Give the proof for its pyranose ring structure.
- b) What is ene-diol rearrangement? Explain with example. (3,1)
- VIII. a) Why glucose and mannose result in the formation of same osazone? Give the mechanism of osazone formation from glucose.
- b) What are erythro- and threo- isomers? Give example for each. (3,1)

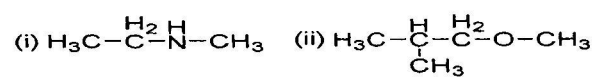
UNIT – V

IX. Answer the following:-

- a) In π -bonded systems, which different types of electronic excitations are observed?
- b) What is the importance of Finger print region?

(3)

- c) Define chemical shift in NMR spectroscopy.
- d) Give the splitting pattern of the signals for the hydrogen(s) in the PMR spectra of following compounds:



- e) Write the structure of (i) starch and (ii) cellulose.
- f) What is (i) mutarotation and (ii) epimers (6x1)

x-x-x