

St. Joseph's College (Autonomous), Bengaluru-27  
B.Sc. Chemistry - V Semester  
Mid-Semester Examination: August 2019  
CH 5115: Organic Chemistry

Time-60 minutes

Maximum Marks-30

Instruction: The question paper has two printed pages and three parts.

Part A

Answer any four of the following. Each question carries two marks. (2 X 4 = 8)

1. Define chemical shift in H-NMR spectroscopy. In what unit it is expressed?
2. Give an example for Williamson ether synthesis.
3. Write the mechanism for the addition of HCN to a carbonyl compound.
4. Give an example for Michael addition.
5. Write the keto-enol form of any carbonyl compound.

Part B

Answer any three of the following. Each question carries six marks. (6 X 3 = 18)

6. Give the mechanism for base catalysed aldol reaction. What happens to the product if this reaction is carried out at higher temperature.
7. How would you synthesize
  - a) a ketone from an alkene
  - b) an aldehyde from a nitrile
  - c) an enamine from aldehyde
8. a) What is the effect of concentration on the shape and IR stretching frequency of O-H band in alcohols (when it is diluted using  $\text{CCl}_4$ ).  
b) Write the structure of the reference compound used in H-NMR spectroscopy? Give any two reasons why this compound is used as a reference.
9. a) What is Claisen-Schmidt reaction? Give an example.  
b) List the electronic transitions that occur in the UV-visible region. Acetone shows two absorption peaks one at 280 nm and another at 187 nm. Which electronic transition do you attribute these absorptions to?

Part C

Answer any one the following. Question carries four marks. (4 X 1 = 4)

10. Explain the following observations
  - a) The infrared  $\text{C}\equiv\text{C}$  stretching absorption in symmetrical alkynes is usually absent.

b) The C-O stretching in ethers occur at 1000-1100  $\text{cm}^{-1}$  when the carbon is  $\text{sp}^3$  hybridized but at 1250  $\text{cm}^{-1}$  in esters when it is  $\text{sp}^2$  hybridized.

11. Identify the A, B, C, D in the following reactions.

(NOTE: a strong acid at a high temperature leads to dehydration of alcohols)

