

Exam. Code : 103206

Subject Code : 1334

B.A./B.Sc. 6<sup>th</sup> Semester

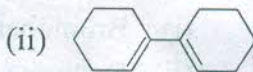
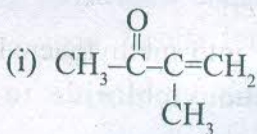
CHEMISTRY

(Organic Chemistry—A)

Time Allowed—2 Hours] [Maximum Marks—35

Note :— Attempt any *four* questions. All questions carry equal marks.

1. (a) What is meant by chromophores and auxochromes ? How do auxochromes affect the positions of absorptions of chromophores ? Give suitable examples to illustrate your answer.
- (b) Calculate  $\lambda_{\max}$  for the compound :



- (c) Sketch the NMR spectrum of ethyl alcohol that has been shaken with a drop of  $\text{D}_2\text{O}$ .
2. (a) PMR spectrum of an aromatic hydrocarbon (molecular mass 120) exhibits three signals at  $\delta 1.2$ (d, 6H),  $\delta 2.8$ (m, 1H) and  $\delta 7.2$ (s, 5H). Work out a structure for the compound.
- (b) Identify the most shielded and least shielded proton in 2-bromopentane.
- (c) What is condensation polymerisation ? Discuss the preparation of Nylon-66.

3. (a) An organic compound (mol. wt. 108), not an acid, which can be easily oxidised to a crystalline compound (m.pt 121°C) gives the following spectral data :

$$\text{UV : } \lambda_{\text{max}} = 255 \text{ nm } (\epsilon = 202)$$

$$\text{IR : } \nu_{\text{max}}^{\text{cm}^{-1}} = 3402(\text{s, br}), 3065(\text{w}), 2888(\text{m}), \\ 1499(\text{w, sharp}), 1455(\text{m})$$

$$^1\text{H NMR : } \delta = 3.90(\text{s}), 4.60(\text{s}), 7.26(\text{s}) \text{ in} \\ 1 : 2 : 5 \text{ ratio}$$

Deduce the structure of the organic compound showing your reasoning.

- (b) Write a note on natural rubbers.
- (c) Why is no PMR spectrum obtained for  $\text{CCl}_4$  ?
4. (a) How will you convert :
- Bromobenzene into methylphenylthioether
  - Benzene sulphonylchloride to benzene sulphonamide
  - Benzene sulphonic acid into benzene ?
- (b) Discuss the mechanism of Claisen condensation.
- (c) What are the homopolymers and copolymers ?
5. (a) Write the various steps involved in Ruff degradation.
- (b) Sketch the following transformations :
- Glucose to fructose
  - D-(+)-Glucose to D-(+)-Mannose
- (c) What do  $\alpha$ -, D and (+) in the name of  $\alpha$ -D-(+)-glucose indicate ?

6. (a) Discuss Gabriel phthalimide and Strecker synthesis of  $\alpha$ -amino acids.
- (b) Write short notes on :  
Fibrous proteins and globular proteins.
- (c) In an aqueous solution of alanine, which group acts as the acidic group and which group acts as the basic group.
7. (a) What is meant by :  
(i) Bathochromic shift  
(ii) Hypsochromic shift ?  
Which of these is also known as red shift ?
- (b) What are  $\alpha$ -amino acids ? Give evidence supporting their dipolar ionic structure.
- (c) What is dithiane ? How can it be converted into its monoalkyl derivative ?
8. (a) Using Benzyloxy-carbonyl chloride, sketch the synthesis of a dipeptide.
- (b) Indicating clearly the linkages involved, write down the structures of :  
(i) Cellulose  
(ii) Amylose.
- (c) Describe the principle of NMR spectroscopy.