

This question paper contains 4 printed pages.

4604

Your Roll No.

B.Sc. Prog. / III

AS

CH-302 : ORGANIC CHEMISTRY

Time : 2 hours

Maximum Marks : 50

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Answer four questions in all.
Question No. 1 is compulsory
and carries 14 marks.*

1. Answer any seven parts:

- (a) Convert naphthalene to β -naphthol.
- (b) Convert pyridine to—
 - (i) Pyridine-N-oxide
 - (ii) 3-Nitropyridine.
- (c) Give synthesis of \pm nicotine starting with Ethyl nicotinate.
- (d) Discuss in brief the Ziegler-Natta catalysed polymerization reaction.
- (e) Glucose, fructose and mannose form the same osazone on reaction with phenyl hydrazine hydrochloride and sodium acetate. Why? Write only the structure of osazone (indicating the configuration at all asymmetric carbon atoms).

P. T. O.

(f) What occurs when an electric current is passed through an aqueous solution buffered at $\text{pH}=6.0$, of alanine (6.0), glutamic acid (3.2) and arginine (10.7). The isoelectric points of the amino acids are given in the brackets.

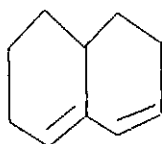
(g) Compound *A* ($\text{C}_7\text{H}_6\text{O}_2$) gives brisk effervescence with a solution of sodium bicarbonate. It shows the following absorptions in its IR spectrum in concentrated solution:

(i) A broad signal centered at $\sim 3000 \text{ cm}^{-1}$

(ii) A strong absorption band at $\sim 1680 \text{ cm}^{-1}$

Assign the above absorptions to the functional group present in the compound *A*.

(h) Calculate the position of λ_{max} of the following compounds:



(i) Base value for a homoannular diene: 253 nm

(ii) Base value for a heteroannular diene: 217 nm

(iii) Increment for an alkyl group or aring residue: +5

(iv) Exocyclic double bond: +5

7×2

2. (a) How is anthracene obtained from benzene and phthalic anhydride?
- (b) Give the products of reaction of furan with the following reagents:
- (i) Maleic anhydride
 - (ii) RCOCl in presence of SnCl_4 as a catalyst
 - (iii) *n*-butyl lithium
 - (iv) $\text{C}_6\text{H}_5\text{N}_2^+\text{Cl}^-$ in presence of sodium hydroxide. 6,6
3. (a) What are nylons? Give synthesis and important uses of nylon 66.
- (b) What is the botanical name of the plant from which natural rubber is obtained? Describe in brief the isolation of rubber from this plant. Write the structure of the major product obtained on ozonolysis of natural rubber. 6,6
4. (a) Describe the synthesis of a dipeptide glycyl-alanine by solid phase synthesis.
- (b) What do you understand by the terms essential and non-essential amino acids? Give *two* examples of each type. Give the reaction of alanine with:
- (i) Formaldehyde

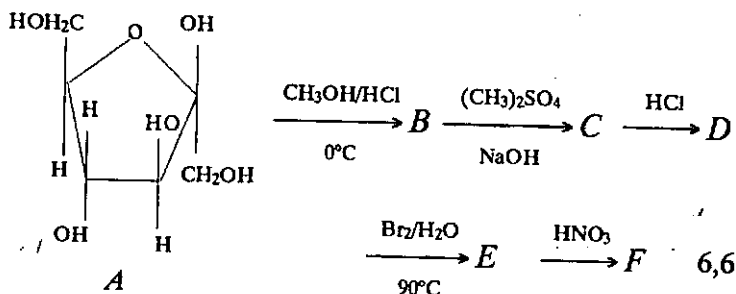


4,0,4

6,6

5. (a) What are carbohydrates? Give *two* examples with structure. Explain the term mutarotation using a specific example.

(b) Complete the following reaction sequence and give the name of compound A: 6,6



6. (a) An organic compound A ($\text{C}_3\text{H}_6\text{O}$) gives a positive DNP and iodoform test. In addition to other absorptions, its IR spectrum shows an absorption at about 1715 cm^{-1} . What is this absorption due to? Write the structure of compound A.

(b) What do you understand by the terms chromophores, auxochromes, bathochromic shift and hypsochromic shift? Explain why 1,3-pentadiene will show an absorption at a longer wavelength as compared to 1,4-pentadiene in the UV spectrum.

6,6