



‘সমানো মন্ত্র: সমিতি: সমানী’

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 5th Semester Examination, 2021

CC11-CHEMISTRY**ORGANIC CHEMISTRY-IV**

Time Allotted: 2 Hours

Full Marks: 40

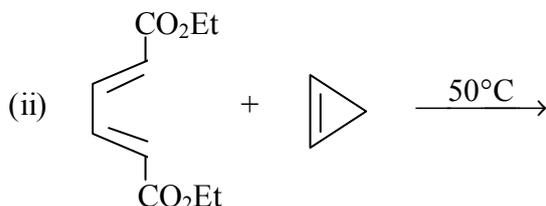
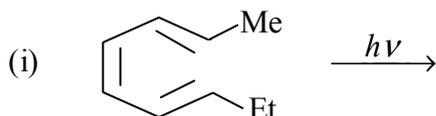
*The figures in the margin indicate full marks.
All symbols are of usual significance.*

Answer any four questions from the following

10×4 =40

1. (a) Predict the product of the following reactions from FMO considerations:

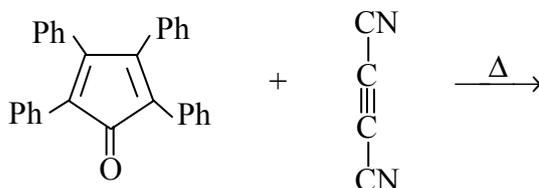
2×2=4



(b) (2Z, 4Z)-2,4-Hexadiene generally does not undergo Diels-Alder reaction. — Explain. 1

(c) Explain endo-selectivity in Diels-Alder reaction. 2

(d) Predict the product(s) of the following reaction and explain the mechanism: 3



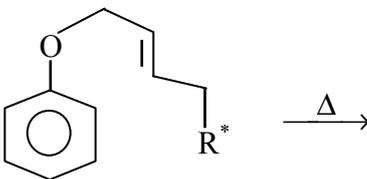
2. (a) Write down the chemical structure and name of DCC. Write down the mechanism of its use in peptide synthesis. 1+2

(b) What are the drawbacks of DCC-mediated peptide coupling? 2

(c) Which alternative chemical can be used instead of DCC? Mention its preference. 2

(d) Why proline does not give Ruhemann's purple colour with ninhydrin? — Explain. 1

(e) Convert glycine to phenylalanine. 2

3. (a) How would you synthesize the di-peptide $\text{NH}_2 - \text{Ile} - \text{Phe} - \text{COOH}$? Mention the N-terminal, C-terminal protecting groups, coupling agents and proper reaction conditions. 3
- (b) Why Edman degradation reaction is much better than the Sanger reaction? Explain with mechanism. 3
- (c) What happens when ethyl chloroacetate is treated with potassium phthalimide followed by hydrolysis? 2
- (d) Give one example with structure for each hydrophobic and basic amino acid. How they can be easily separated by electrophoresis? 2
4. (a) Explain why [1,5] sigmatropic H-shift in penta-1,3-diene is very facile, but [1,3]-sigmatropic H-shift is not observed. $2\frac{1}{2}$
- (b) Write down the product and give the mechanism of the following reaction: $2\frac{1}{2}$
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- (c) What is the difference between a nucleotide and nucleoside? Draw the structure of each one from RNA molecule. $2\frac{1}{2}$
- (d) Write a note on saponification. $2\frac{1}{2}$
5. (a) State briefly the structural and functional differences between DNA and RNA. 3
- (b) Write notes on Watson-Crick model of double helix structure of DNA. 4
- (c) What is co-enzyme and cofactor? Define with examples. 3
6. (a) Explain what is meant by replication of DNA. $2\frac{1}{2}$
- (b) Write short note on enzyme inhibitors. $2\frac{1}{2}$
- (c) What do you mean by Catabolism and Anabolism? 3
- (d) What is iodine number of fat? — Explain. 2
7. (a) Draw the chemical structure of ATP. 2
- (b) Describe the 'lock and key model' of enzyme action. 2
- (c) Discuss the conversion of glycerol into PGAL. 2
- (d) Convert Urea to Thymine. 2
- (e) Define the calorific value of food. 2

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