UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 5th Semester Examination, 2023

CC11-CHEMISTRY

ORGANIC CHEMISTRY

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.

1.   Answer any *five* questions from the following: 1×5 = 5

 (a) What is allosteric inhibition?

 (b) Define coenzyme with example.

 (c) Draw the frontier molecular orbital (FMO) of 1, 3-butadiene.

 (d) Draw the structure of L-arginine.

 (e) Why proline does not give Ruhemann's purple colour with ninhydrine? Explain.

 (f) What are transferases? Give an example.

 (g) How does DNA differ from RNA?

 (h) Define an electrostatic reaction.

2.   Answer any *three* questions from the following: 5×3 = 15

 (a) (i)   What is hardening of oil? How is it industrially important?   1+1

  (ii) Give one similarity and two differences between fats and oils.   3

 (b) (i)   Explain why guanosine is hydrolysed more rapidly than adenosine.   2

 (ii) Complete the following reaction with proper mechanism.   3
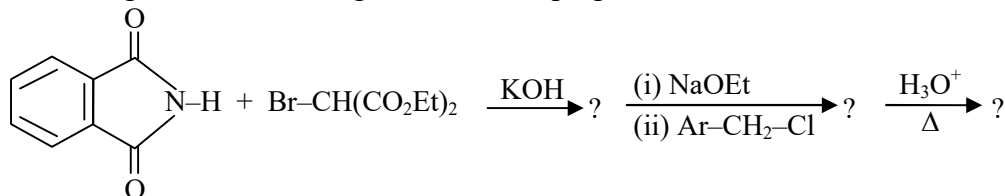

 (c) (i)   Why is isoelectric point of amino acid is important? Explain.   2

  (ii) What is Merrifield's resin? Write down of the synthesis of peptide with   1+2
        Merrifield's resin.

 (d) (i)   Discuss about specificity of enzyme action and salient features of active   3
        sites of enzymes.

  (ii) Define calorific value of food.   2

 (e) (i)   Why [2+2]-cycloaddition reaction is forbidden? However [2+2]-cycloaddition   2+2
        reaction of Ketene is a facile process? Explain.

  (ii) What are polynucleotide strand? Explain with example.   1

3. Answer any *two* of the following: $10 \times 2 = 20$

  (a) (i) Outline the sequence of reactions that occur in The Krebs cycle.   5

     (ii) Write a short note on α-helix structure of proteins.   3

     (iii) Give a resolution method of DL-phenylalanine.   2

  (b) Write down the product(s) with proper mechanism and stereochemistry: $2\frac{1}{2} \times 4 = 10$
(any *four*)

(i)

(ii)

(iii)

(iv)

(v) (2E, 6E)-octa-2, 6-diene $\xrightarrow{\Delta}$
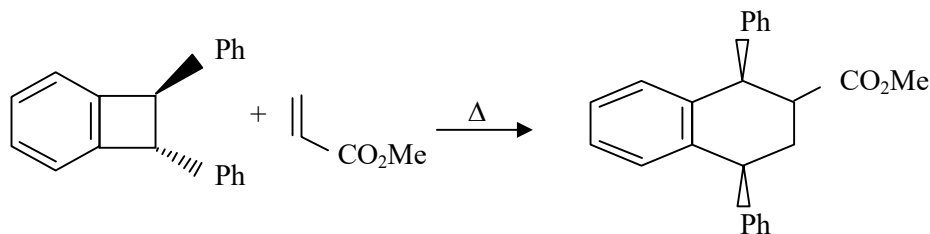
(vi)
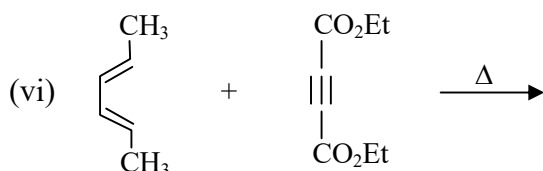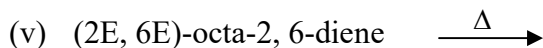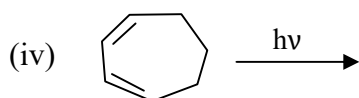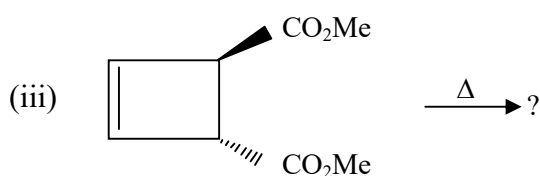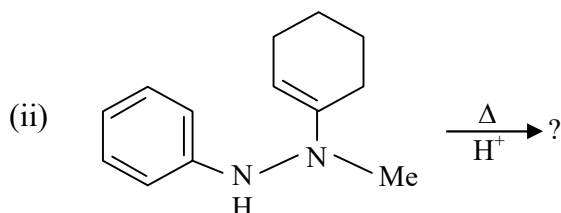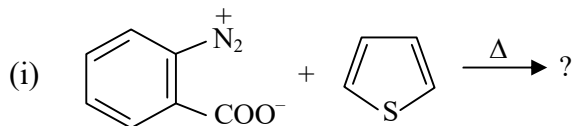
  (c) (i) Why rancidity is observed in lipid? How can it be prevented?   2+3

     (ii) Nitrous acid is very damaging chemical mutant for DNA and RNA molecule. Justify the statement with specific examples.   3

     (iii) Define the terms metabolism and catabolism.   2

  (d) (i) Edman degradation method is better N-terminal detection method than Sanger's method — Explain.   4

     (ii) Explain the following reaction with the help of FMO: 4

     (iii) What is glycolysis?   2

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