2023

M.Sc.

4th Semester Examination

CHEMISTRY

PAPER – CEM-402 (Organic Special)

Full Marks : 50

Time : 2 Hours

(CEM 402-Advanced Organic Chemistry-III)

1. Answer any ***four*** bits: 2×4 = 8

(a) What are the three basic units of Streptomycin?
(b) Give an example of Norrish type-I reaction.
(c) What happens when penicillin is treated with dilute HCl?
(d) Write down the basic structure of the DNA sequence ACGTA.
(e) What are the functions of vit A? Write down its structure.
(f) What is photosensitized reaction? Give an example.

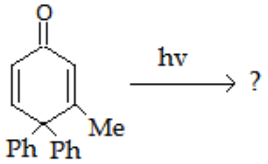
2. Answer any ***four*** bits: 4×4 = 16

(a) Define Norrish type-II reaction. Explain that reaction with suitable example. (4)
(b) Briefly describe the function of RNA in protein synthesis. (4)
(c) (i) Describe the function of Thiamine and draw its structure.
(ii) What do you mean by ISC? (3+1)
(d) (i) Why are beta-lactum antibiotics relatively non-toxic to human body?
(ii) Classify antibiotic on the basis of spectrum of activity. Give example. (2+2)
(e) (i) Which vitamin is known as anti-hemorrhagic vitamin?
(ii) What are the functions of mRNA and tRNA. (1+3)
(f) Write a detailed note on *cis-trans* isomerization of alkenes

3. Answer any ***two*** questions 2×8 = 16

(a) (i) What are the nucleotides present in DNA?
(ii) Describe the hydrogen bonding pattern between Guanine & Cytosine and Adenine & Thymine.
(iii) Describe the structure of DNA is details. (2+3+3)

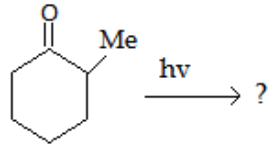
(b) (i) What is di-π-methane rearrangement reaction? Explain the mechanism of the reaction with suitable example.
(ii) Indicate all the mechanistic steps of the following reaction.



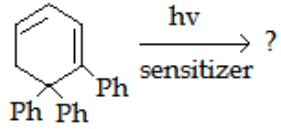
(iii)Does this reaction follow the mechanism of di-π-methane rearrangement? (3+3+2)

(c) (i) Predict the product of the following reactions with plausible mechanism.

I)



II)



(ii) Give an example of intramolecular Paterno-Büchi reaction. (3+3+2)

(d) (i) Draw Jablonoski Diagram and show the different transitions of excited states of molecules.
(ii) What are coenzymes? What is the function of NAD and FAD.
(iii) What is mutation of DNA? Explain with an example. (3+3+2)

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Internal Assessment-10

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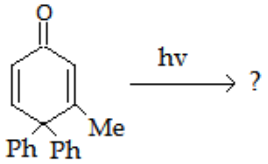

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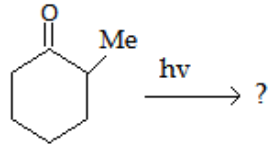

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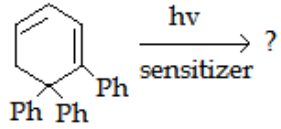

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