No. of Printed Pages : **3**

21ICH2C6L

Sl. No.

M.Sc. II Semester Degree Examination, Sept./Oct. - 2024

INDUSTRIAL CHEMISTRY

DSC-6 : Chemistry of natural products, reagents in organic synthesis and heterocyclic compounds.

(NEP)

Time : 3 Hours Maximum Marks : 70

Note : *(i) Answer **any five** questions including **Q.No.1**.*

*(ii) **Q.No.1** is **compulsory.***

1. (a) Write the classification of alkaloids with example.

(b) How will you establish the nature of nitrogen in alkaloids using chemical evidences ?

(c) Give the steps involved in the structure elucidation of santonine.

(d) Write the stereochemical structure of ergosterol. Sketch its synthesis. **4+3+3+4=14**

2. (a) How the pyranose ring structure is determined in fructose ?

(b) Write briefly on the modern synthesis of peptide using suitable example.

(c) Write a note on double helix of DNA and indicate the base pairing. **5+5+4=14**

3. (a) Give the Hinsberg synthesis for thiophene. Discuss its electrophilic and nucleophilic reactions.

(b) Electrophilic substitution in pyridine occurs at 3-position, whereas nucleophilic attack takes place at 2- and 4-position. Explain.

(c) Sketch the Skraup quinoline synthesis. Discuss its electrophilic and nucleophilic reactions. **4+5+5=14**

4. (a) What is Peterson's synthesis ? Give its mechanism using suitable example. Mention its applications in organic synthesis.

(b) Write an account on functional group transformations using minimum three different examples.

(c) Discuss the applications of DDQ and selenium dioxide in organic synthesis. **5+5+4=14**

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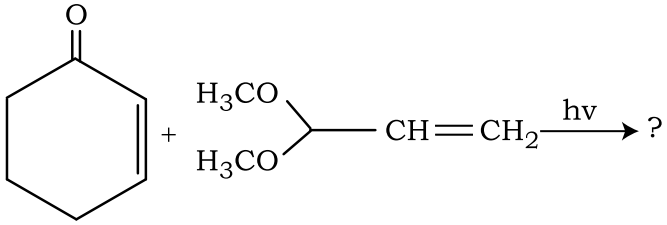
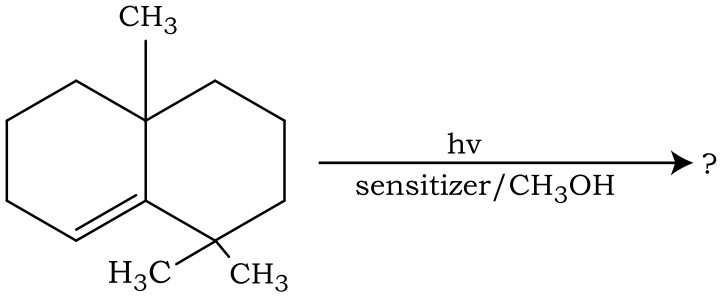
5. (a) What is Patterno-Buchi reaction ? Write its mechanism using suitable example. Mention its applications.

(b) Predict the product(s) (indicate major and minor) with correct stereochemistry (if any) with suitable mechanism :

(i)



(ii)



(c) Write a note on chemical processes in excited molecules. **5+5+4=14**

6. (a) Give the chemical evidences that led to the structure determination of maltose.

(b) Write an account on sequencing of amino acids in proteins.

(c) Mention the different types of RNA and discuss their functions. **4+5+5=14**

7. (a) What are the hydrolysis products of nucleic acids ? Write their names and structures.

(b) Sketch the synthesis of benzofuran. Discuss its two electrophilic and two nucleophilic reactions.

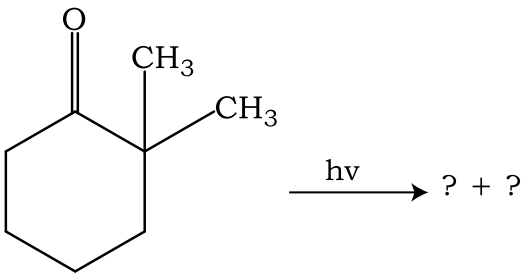
(c) Discuss the applications of DCC and crown ethers in organic synthesis.

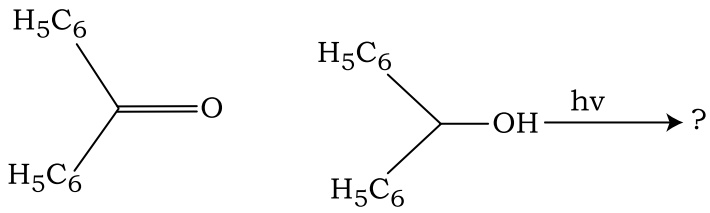
5+4+5=14

8. (a) What is Wilkinson's catalyst ? With illustrative examples discuss its applications.

(b) Discuss the photochemistry of aromatic compounds by taking at least three examples.

(c) Predict the product(s) (major/minor if any) with suitable mechanism for the followings :

(i) 

(ii) 

4+5+5=14

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