

**M.Sc.Examination, 2018**  
**Semester-III**  
**Chemistry (Elective)**  
**Course: CH-915**  
**Optional ( Organic Chemistry)**

**Time: Three Hours**

**Full Marks: 40**

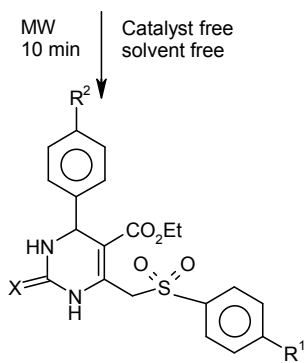
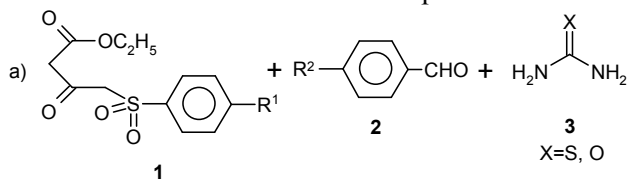
Questions are of value as indicated in the margin.  
 Answer **four** questions, taking **any two** from each group.

**Group-A**

1. a) Identify the class of the following supramolecular complexes as well as the host, guest and type of interactions associated with these systems. Draw the structure of the host in each case. 4
  - (i)  $[K^+ \subset 18\langle O_6 \text{ 2}_6 \text{ Corand} - 6 \rangle]$       (ii) Spherand .  $(Me^+NH_3)$
- b) Do you agree that DNA double helix is an excellent example of supramolecular assembly? Draw the structure of DNA double helix and justify your answer. 3
- c) Arrange following hosts in an increasing order of their preorganisation effect. Justify your answer. 3
  - (i) Pentaethylene glycol dimethyl ether, (ii) BiBLE, (iii) [2.2.2] Cryptand, (iv) Spherand-6, (v) [18]-Crown-6.
2. a) Discuss briefly: (i) High dilution technique (ii) Template synthesis. 3x2
- b) What is Pedersen's initial synthesis of first crown ether, dibenzo[18]crown-6? 2
- c) What are ionophores? Discuss briefly their importance in biological systems. Name two natural product based ionophores. 2
3. a) [18]crown-6 has different structure in its solid state or as complex with  $K^+$  ion - even it shows different structures in polar and non-polar solvents. Explain why. Give the structure of [18]crown-6 in each of these four cases. 4+4
- b) Tricyclic soccer ball cryptands are capable of both tetrahedral and spherical molecular recognition – Explain. 2

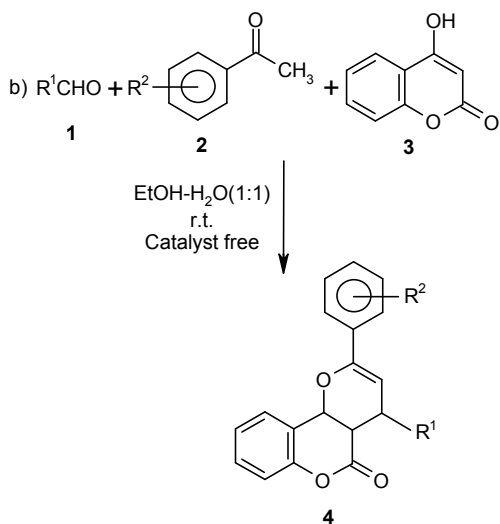
**Group-B**

1. Discuss in detail the mechanistic aspects of the following reactions: 5x2

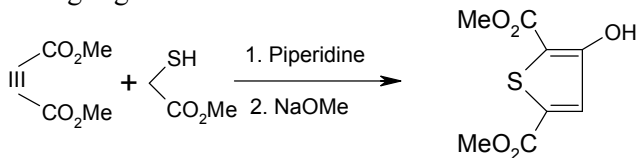


**P.T.O.**

(2)



2. a) Outline the general reaction scheme for 'Bartoliindole synthesis' and give its plausible mechanism. Mention any one example from the recent advances in this research field. 1+2+2  
b) Rationalize following organic transformation: 5



3. a) What is Fiest-Bénary reaction? Give its plausible mechanistic pathway. 1+3  
b) Give synthetic routes for the following heterocycles (*any two*): 3x2

