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**ICH 503**

III Semester M.Sc. Degree Examination, December 2018
INDUSTRIAL CHEMISTRY
Synthetic, Heterocyclic and Medicinal Chemistry

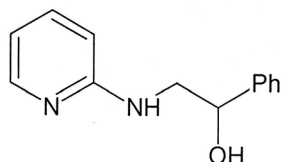
Time : 3 Hours

Max. Marks : 70

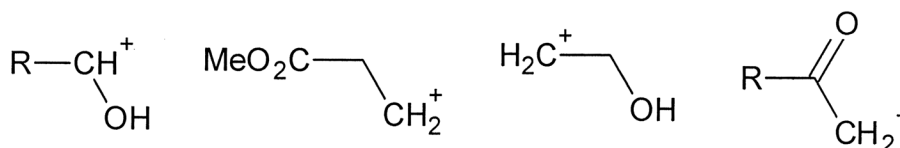
PART – A

1. Answer **any five** questions.**(5×2=10)**

a) Perform retrosynthetic analysis for the following compound.



b) Suggest suitable reagents for the following synthons.



- c) Write any one synthetic method for sydnone using 1,3-dipolar cycloaddition reaction.
- d) Will thermal 1,3-migration of carbon occur with retention or inversion of configuration ? Justify your answer.
- e) Predict the most preferred site for the aromatic electrophilic substitution reaction in benzo[b]thiophene. Justify your answer.
- f) Give reasons : pyridine is basic in nature but not pyrrole.
- g) What are local anesthetics ? Give an example.
- h) What are prodrugs ? Explain with an example.

P.T.O.

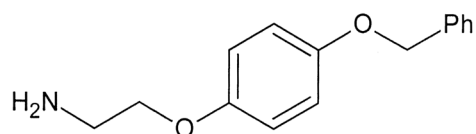


PART – B

Answer **any five full** questions.

(5×12=60)

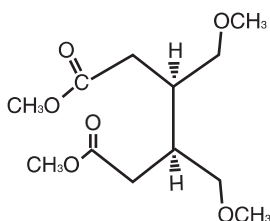
2. a) Write the possible disconnections for the following molecule and suggest a feasible synthetic route.



- b) Explain protection and deprotection reactions of any two amino group protecting reagents.

- c) Perform retrosynthetic analysis of the following :

[4+4+4]



3. a) With suitable examples, explain the utility of two group C-C disconnections in the synthesis of 1,3 and 1,4-difunctionalised compounds.

- b) Discuss the solid phase synthesis of polypeptides.

- c) Perform retrosynthetic analysis of 2-methyl-6-methoxy-indole-3-acetic acid.

[5+4+3]

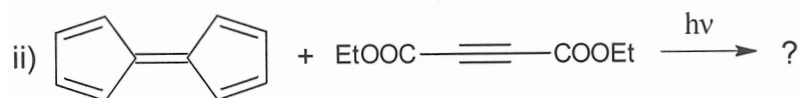
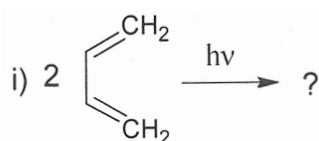
4. a) Explain the electrocyclic reaction of (2E,4Z,6E) octatriene.

- b) Illustrate the suprafacial and antarafacial modes in cycloaddition reactions.

- c) Explain the Aza-Cope rearrangement.

[5+4+3]

5. a) Predict the products in the following and justify your answer.





- b) Discuss [3, 3] sigmatropic rearrangement with examples.
- c) Illustrate the synthesis of five membered heterocyclic systems using 1,3-dipolar cycloaddition reactions. **[4+4+4]**
6. a) Compare the general reactivity of pyrazole and imidazole.
- b) Give two synthetic methods each for thiazole and benzofuran derivatives.
- c) Briefly explain the nomenclature system for the systematic naming of fused heterocycles. **[4+4+4]**
7. a) Compare and differentiate between indole and pyridine in terms of their general, reactivity and reactions.
- b) Illustrate the conversion of furans into nonheterocycles.
- c) Give a brief account of following transformations.
- i) Coumarin to benzofuran.
- ii) Indole to Quinoline. **[4+4+4]**
8. a) With suitable examples, explain the molecular disjunction and conjunction approaches of drug design.
- b) Write a note on important types of drug-receptor interactions.
- c) Give the synthesis of Cincophen. Explain its mode of action as an antipyretic analgesic. **[4+4+4]**
9. a) Explain the Occupancy theory and the Rate theory of drug action.
- b) Explain the synthesis and mode of action of following drugs.
- i) Chloroquine as antimalarial agent
- ii) Diazoxide as cardiovascular drug.
- iii) Fluorouracil as antineoplastic agent. **[4+8]**
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