

Roll No. \_\_\_\_\_

[Total No. of Pages : 2

**PGIIS-O 1058 A-18**  
**M.Sc. IInd Semester Examination**  
**CHEMISTRY/ORGANIC CHEMISTRY**  
**(Organic Chemistry-II)(CBCS)**  
**Paper : HCT - 2.2**  
**(Old)**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

1. Answer any **eight** of the following :

**(8×2=16)**

- a) What are Meisenheimer complexes? Give an example.
  - b) Formulate a reaction involving double bond shift.
  - c) Define enantiotopic and diastereotopic groups with suitable examples.
  - d) What is atropisomerism? Give an example.
  - e) Sketch any one method for the synthesis of coumarin.
  - f) With the help of resonance structures show the preferred position for electrophilic substitution reaction in pyrazole.
  - g) What do you mean by concept of lead compound?
  - h) Give the factors influencing drug metabolism.
  - i) Outline the synthesis of sulfadiazine.
  - j) What is chloromethylation? Give its mechanism.
2. a) What is Vilsmeier - Haach reaction? Explain its mechanism with suitable example.
- b) Explain with suitable example isotope effect in aromatic electrophilic substitution reactions.
- c) Write briefly on electrophilic addition across alkenes and dienes.

OR

- c) Discuss  $BAC_2$  and  $AAC_2$  mechanism by taking suitable example. (5+5+6=16)
3. a) Discuss the optical activity of allenes and spiranes.
- b) What is Cram's rule? Explain its cyclic model using appropriate example.
- c) Write an account of stereoselective catalytic hydrogenation.

OR

- c) What is Prelog's rule? Discuss its applications. (5+5+6=16)
4. a) Sketch a method for the synthesis of benzofuran. Give one electrophilic and one nucleophilic reaction of it.
- b) Write an account of electrophilic and nucleophilic substitution reactions of chromones.
- c) Give any one method for the synthesis of the followings :
- Isoquinoline
  - Pyrazole

OR

- c) i.  $\alpha$  - Pyrone.
- ii. Indole (5+5+6=16)
5. a) Sketch the synthesis of penicillin - V and discuss its mode of action.
- b) Discuss Phase - I reaction of drug metabolism.
- c) Give the synthesis and mode of action of sulfaisoxazole.

OR

- c) Write an account of QSAR. (5+5+6=16)



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**Paper : HCT - 2.2**  
**(New)**

Time : 3 Hours

Maximum Marks : 80

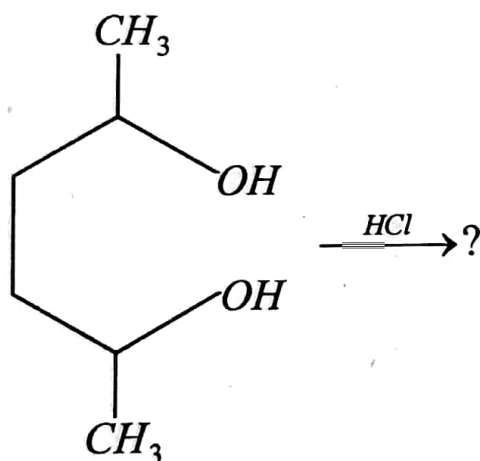
**Instructions to Candidates:**

- i) Answer all questions.
- ii) All questions carry equal marks.

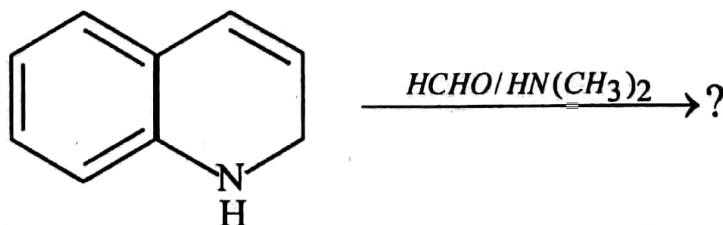
1. Answer the following :

**(8×2=16)**

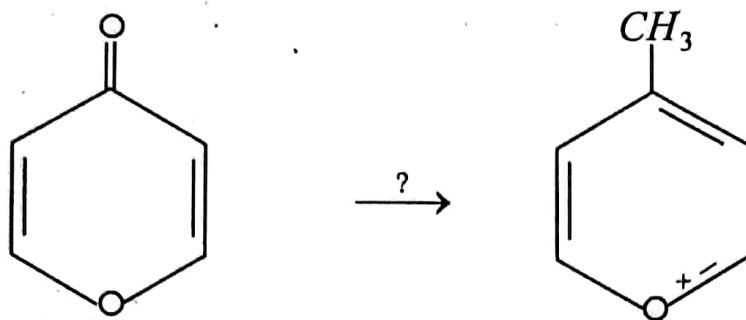
- a) Predict the product formed in the reaction given below and name the reaction.



- b) What are Meisenheimer complexes?
- c) Differentiate homotopic and diastereotopic hydrogens.
- d) What is molecular crowding?
- e) Predict the product in the following reaction.



- f) Mention the reagents/conditions for the reaction given below.

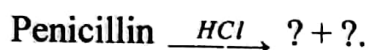


- g) List the factors governing drug design.

- h) What are the products formed when penicillin - V is heated with HCl? Write the structures.

- i) What are flavones?

- j) Predict the product (s)



2. a) Outline the mechanism of Vilsmeier - Haack reaction.  
 b) Discuss the electrophilic addition with alkenes and dienes.

- c) Explain  $S_NAr$  and  $S_N1$  reactions with stereochemistry.

(5+5+6=16)

OR

- c) Account for the following :

(6)

- i) Reactions involving double bond shift.

- ii) Mechanism of ester hydrolysis.

3. a) Discuss the optical activity in biphenyls taking suitable examples.

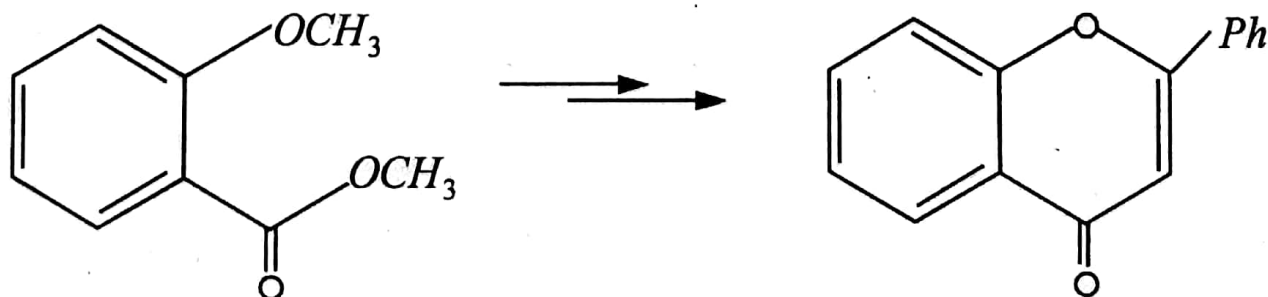
- b) Write a note on stereoselective cyclisation of polyenes.

- c) What is Cram's rule? Explain the open chain model with suitable example. (5+5+6=16)

OR

- c) Explain Cahn, Ingold and Prelog rule used for the determination of absolute configuration. (6)

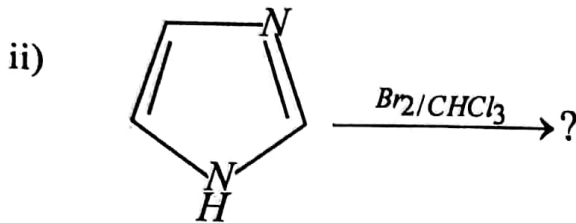
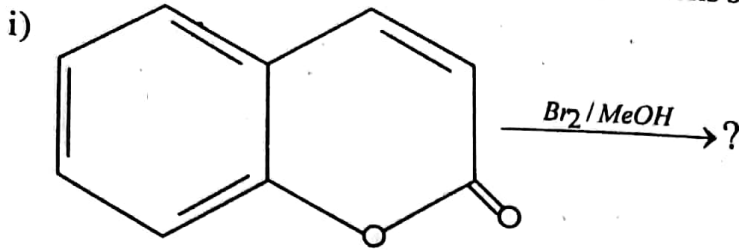
4. a) Explain the steps involved in the following reaction along with reagents/conditions.



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(2)

- b) Discuss the electrophilic substitution reactions of benzofuran.  
 c) Write the products & mechanism for the reactions shown below.



(5+5+6=16)

OR

- c) i. Write any two reactions of  $\gamma$  - pyrone.  
 ii. Outline the synthesis of benzothiophene. (6)

5. Write notes on the following :

- a) QSAR.  
 b) Factors influencing drug metabolism and drug availability.  
 c) Outline the synthesis and mode of action of sulfadiazine. (5+5+6=16)

OR

- c) Discuss the mode of action of any two semisynthetic penicillins. (6)