

AU-287

M.Sc. Semester-I (C.B.C.S. Scheme) Examination
PHARMACEUTICAL CHEMISTRY
(Organic Chemistry)
Paper—1SA2

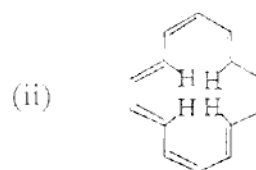
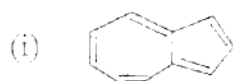
Time : Three Hours]

[Maximum Marks : 80

Note :— (1) **ALL** questions are compulsory.

(2) All questions carry equal marks.

1. (a) What is aromaticity ? Classify the following compounds into aromatic, anti-aromatic and non-aromatic compounds :



5

- (b) Explain with energy level diagrams Alternant and non-alternant hydrocarbons. 5

- (c) Explain the terms :

(i) Conjugation and cross-conjugation

(ii) Fullerene.

6

OR

- (p) Discuss benzenoid and non-benzenoid compounds with examples. 6

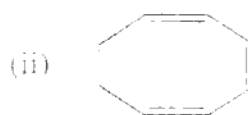
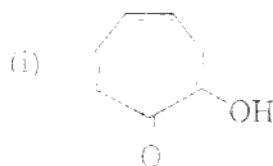
- (q) Explain the following terms :

(i) Homoaromatic and

(ii) Hyper-conjugation.

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- (r) Classify the following compounds into aromatic, anti aromatic and non-aromatic on the basis of $(4n + 2) \pi$ and $(4n) \pi e^-$ rule theory.



5

2. (a) Write a note on decalins.

5

- (b) Explain the different methods of resolution of racemic mixture.

5

- (c) Explain 'Asymmetric synthesis' with different examples.

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OR

- (p) Explain stereochemistry of nitrogen containing compounds.

5

- (q) Explain the following terms :

(i) Plane of symmetry

(ii) Axis of symmetry

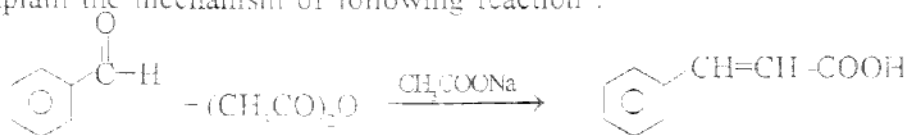
(iii) Centre of symmetry.

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- (r) Acetolysis of trans-2-iodocyclohexyl brosylate undergoes 2.7×10^6 times faster than cis-isomer. Explain.

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3. (a) Explain the mechanism of following reaction :

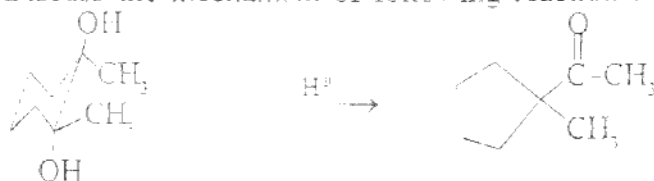


Write the name of reaction.

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- (b) Discuss the mechanism of following reaction :

5



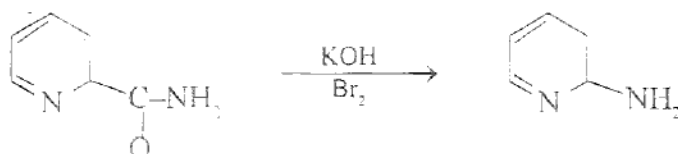
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- (c) Discuss the mechanism of :
 (i) Beckmann-rearrangement
 (ii) Schmidt rearrangement.

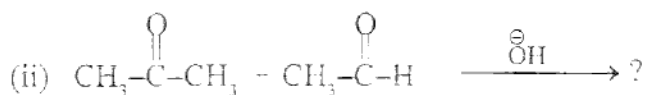
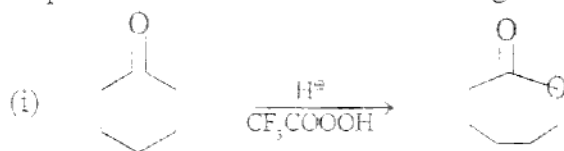
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OR

- (p) Explain the mechanism of following reaction. Also write the name of reaction : 5



- (q) Discuss the mechanism of Dieckmann condensation. Also explain its application. 5
 (r) Explain the mechanism of following reactions :



Also name the reactions.

6

4. (a) Give the synthesis of imidazole from the (i) Glyoxal and (ii) Paraldehyde. 6
 (b) Explain Pall-Knorr synthesis of Pyrrole. 5
 (c) What happens when pyridine reacts with following :

- (i) NaNH_2 at 100°C
 (ii) $\text{C}_6\text{H}_5\text{--CH}_2\text{--MgCl}$
 (iii) Br_2 at 500°C
 (iv) $\text{C}_6\text{H}_5\text{--COOH}$
 (v) $\text{C}_6\text{H}_5\text{--NH--NH}_2$, Toluene at 100°C ?

5

OR

- (p) Discuss the structure and synthesis of thiazole. 5
- (q) Compare the reactivity and aromaticity of pyrrole, furan and thiophene. 5
- (r) Write a note on :
- (i) Pyrazole
- (ii) Pyrimidine. 6
5. (a) Compare the kinetics, reactivity, stereochemistry and energy profile diagram of SN^1 and SN^2 reaction. 6
- (b) Write the mechanism of following reaction. Identify the name of reaction. 5
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{C}_6\text{H}_5 \end{array} - \text{CH}_2\text{Cl} \xrightarrow{\text{AlCl}_3} \text{A} - \text{B}$$
- (c) What is electrophilic substitution reaction ? Explain the mechanism of sulphonation of benzene with energy profile diagram. Comment on reversibility of reaction. 5

OR

- (p) Discuss the halogenation reaction of Aniline in detail giving mechanism of each step involved in it. 6
- (q) Explain nitration of nitrobenzene with mechanism. Also explain the orientation and directing influence of nitro group on electrophilic substitution reaction. 5
- (r) Compare reactivity of Aniline and Chlorobenzene towards electrophilic substitution reaction. 5