MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Reg. No.										

DEPARTMENT OF SCIENCES, IV SEMESTER M.Sc (Chemistry)
END SEMESTER EXAMINATIONS, APRIL 2019

Advanced Organic Chemistry – II [CHM 5202]
(REVISED CREDIT SYSTEM-2017)

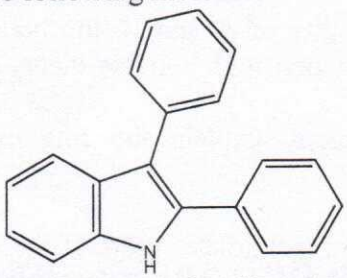
Time: 3 Hours Date: 24-04-2019 MAX. MARKS: 50

Note: (i) Answer **ALL** questions
(ii) Draw diagrams, and write equations wherever necessary

1A. Explain the preparation of pyrrole, furan and thiophene, starting from 1,4-diketone? (3)

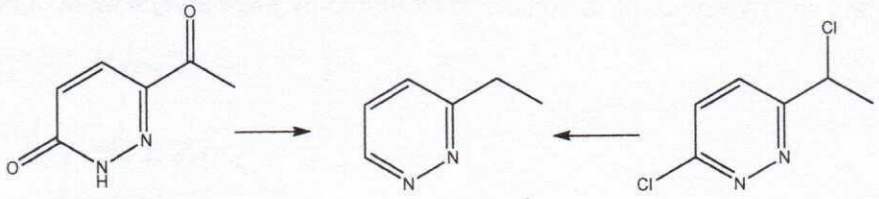
B. Explain the (a) reaction with oxirane (b) nucleophilic and (b) electrophilic substitution reactions of isoquinoline. (3)

C. Write the chemical reaction for the Fisher-Indole synthesis. Also, propose the chemical reaction for the synthesis of the following molecule. (4)



2A. An organic molecule A, gives positive test for diazotization reaction. Another organic molecule answers positively for 2,4-DNP. When they are treated with conc H_2SO_4, heterocyclic compound C, with empirical formula $C_6H_4N_4$ is formed. This does not answer any of the above tests. Write the chemical equation to depict the reactions. (3)

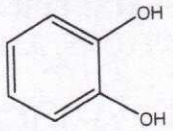
B. Propose the suitable reagents for the following reaction. (3)

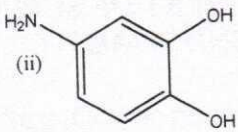


C. Starting with suitable hydrazine, how do you prepare (a) 1,2,4-triazole, (b) 1,2,3-thiadiazole (c) 1,3,4-thiadiazole (d) 1,2,4,5-tetrazine (4)

3A. Starting with suitable unsaturated compound, propose the synthetic route for the preparation of oxirene and azirene. (3)

B. Among the following molecules, identify the suitable substrate, which yields dioxocines in good yield. Justify your answer. (3)

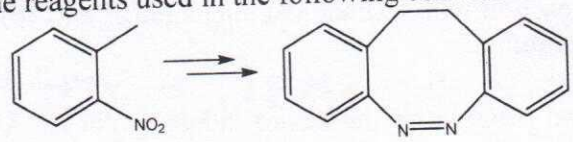
(i) 

(ii) 

C. Identify compound A to E, P, Q, and write the chemical reaction. An organic molecule A, when treated with reagent P, gives the product, B. Also, when A is treated with Q, gives C. B and C, when hydrolyzed, gives D and E respectively. Given that molecule A and not B and C answers positively for bromine water. Compound B and C are heterocyclic compounds. (4)

4A. Propose the chemical reaction for the synthesis of heterocyclic compounds, starting with (a)1,2-diketone (b) 1,3-diketone (c)1,4-diketone. (3)

B. Explain the role of the reagents used in the following conversion. (3)



C. (i) Comment on the stability of A and B, the heterocyclic molecules. Given that A undergoes Diels-alder reaction with suitable diene, and B does not answer for Diels-alder reaction. (4)
(ii) With chemical reaction, explain the ring opening reactions of 6-membered heterocyclic ring system.

5A. Starting with sodium benzenethiolate, propose the two-step method for preparing 3-methyl-benz[b]thiophene. Also, propose one-step method for preparing 3-methyl thiophene. (3)

B. With suitable example, explain how delocalization energy is correlated with aromaticity in heterocyclic compounds. (3)

C. Explain any two types of tautomerism exhibited by heterocyclic compounds. (4)

***