THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

CHE 3422 **ORGANIC CHEMISTRY-V** **Time: 3 Hours**

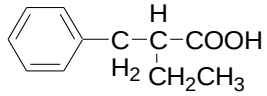
Max Marks: 75

Answer any FIVE Questions: (5 X 15 = 75)

1. a) What is Diels-Alder reaction? Explain the reaction using FMO theory under thermal and photochemical conditions. (10)
   b) Draw the structure of trans, cis, cis-2,4,6-octatriene. Explain its reaction under thermal condition using FMO theory. (5)

2. a) Describe specific synthesis of pyridine, indole & quinoline. (9)
   b) Explain the electrophilic and nucleophilic substitution in pyridine using suitable examples. (6)

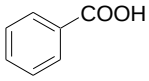
3. a) How will you synthesize the following compounds using diethyl malonate? (7)

a) 

b) 

b) Predict the product of the following reaction. (8)

(i) CH_3MgBr + CH_3COOEt ⟶ ?

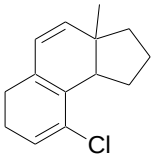
(ii) 

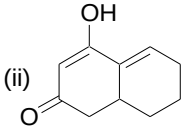
+ C_6H_5Li ⟶ ?

(iii) $(CH_3)_2Cd$ + C_6H_5COCl ⟶ ?

(iv) C_2H_5MgBr + $PbCl_4$ ⟶ ?

4. a) Draw the electromagnetic spectrum and explain the regions. (5)
   b) Explain Mc Lafferty peak taking a suitable example. (4)
   c) Calculate λmax for the following compounds Woodward-Fieser rules. (3+3)

(i) 

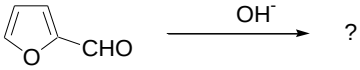
(ii) 

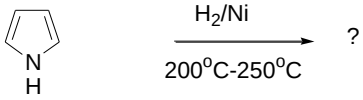
5. a) How will you distinguish ortho, meta & para-chloro nitro benzene using ^1H & ^{13}C NMR techniques? (6)

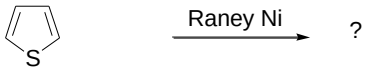
b) Explain the effect of the following on the chemical shift values in NMR spectroscopy.
(i) Electronegativity (ii) Resonance effect (iii) anisotropy effect (9)

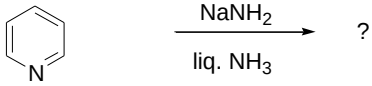
6. a) Discuss in detail the Structure Activity Relationship (SAR) studies of Pencillin. (6)
b) Discuss in detail the classification of drugs based on modes of administration. (9)

7. a) Complete the following reactions: (8)

(i) 

(ii) 

(iii) 

(iv) 

b) How will you differentiate the following compounds using IR spectroscopy? (3+4)

(i) 

(ii) 

****