MANIPAL UNIVERSITY

Reg No										

DEPARTMENT OF SCIENCES

III SEMESTER M.Sc (CHEMISTRY) END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: ADVANCED ORGANIC CHEMISTRY II [CHM 703]

REVISED CREDIT SYSTEM

Time: 3 Hours Date: 26th Nov 2016 MAX. MARKS: 50

Instructions to Candidates:

Answer **ANY FIVE FULL** questions.
Write diagrams or equations wherever necessary

1A An organic molecule, A decolorizes bromine water. When A is treated with a reducing agent, X, product B is formed, which does not decolorize bromine water. Another molecule, C, when treated with X, produces D, which shows a peak at 3300 cm^{-1} in IR and does not have oxygen atom. C when treated with ZnCl2 also gives D. Write the chemical reaction involved in the process.

B Explain stereodynamics of the reaction.

C Propose the reaction by choosing appropriate substrate having two hydroxy groups, where the products formed are (i) two aldehydes (ii) two ketones (iii) aldehyde and ketone and (iv) aldehyde and alcohol. **(3+3+4)**

2A What are carbamate pesticides? Discuss the synthesis and uses if ziram and zineb.

B Describe the following;

(i) Vilsmeyer Haack reaction of pyrrole
(ii) Nucleophilic substitution reaction of indole
(iii) Desulfurization of benzothiophene

C (i) Explain the Paal-Knorr ring closure synthesis of furan. How is furan-2-carbaldehyde prepared from furan?
(ii) Discuss the Barbier and Tischenko reactions of furan-2-carbaldehyde.
(3+3+4)

3A Explain how an aromatic molecule, when treated with a different reagent gives aromatic carboxylic acid, ring halogenation and side chain halogenation.

B Write the product formed when alkene is treated with (i) reducing agent (ii) $KMnO_4$ and (iii) O_3.

C Discuss how the mechanism for an organic reaction can be probed. **(3+3+4)**

4A Explain the following reactions;

i) Diels-Alder reaction of oxepines
ii) Air oxidation of furan
iii) Gabriel ring closure of aziridine

B Give reason for the following statements;

(i) Picaridin is preferred to DEET as an insect repellent
(ii) 5*H*-1,2-Diazepines prefer to exist as bicyclic valence tautomers
(iii) Abscisic acid is one of the most important plant growth regulators

C Explain how synthetic pheromones aid in pest control? Explain the synthesis of bombykol and disparlure. **(3+3+4)**

5A An organic molecule P when treated with reagents A and B, the products Q and R are formed respectively. P, Q and R show IR peak around 1700 cm^{-1}, but P and Q precipates with 2,4 DNP and Q and R are halogenated compounds. Identify A, B, P, Q and R.

B Describe the chemistry of carbynes. How carbynes are different from carbenes?

C Write chemical reaction to show that an alkene can give (i) hydrocarbon, (ii) monohalo derivative (iii) dihaloderivative and (iv) mixture of aldehyde and ketone. **(3+3+4)**

6A Describe the following reactions;

(i) Dichlorocarbenes with pyrrole and
(ii) 1-Bromo-3-chloropropane with basic thiourea

B What is the role of synthetic analogues of juvenile hormones in agrochemistry? Explain the synthesis and uses of methoprene.

C What are organophosphorous pesticides? Explain the synthesis, properties and uses of malathion and phorate. **(3+3+4)**

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