Reg.No.										

Department of Sciences, Manipal University

III SEMESTER M.Sc. END SEMESTEREXAMINATIONS,

DEC 2015/JAN 2016

SUBJECT: Advanced Organic Chemistry [CHM 703]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX.MARKS: 50

Instructions to Candidates:

- Answer ANY 5 Full questions.
- Write chemical equations wherever necessary

1A. What are the advantages of synthetic pyrethroid pesticides over natural pyrethroids? Write the structure, properties, method of action and uses of the pyrethroid pesticide allethrin.

1B. Discuss the following;

i. Ring opening reaction of aziridines
ii. Oxidation and desulfurization reactions of thietane
iii. Retro Diels-Alder reaction of 2,3,5,6-tetrazine

1C. What is the importance of pheromones in agrochemistry. Write the synthetic pathway and uses of the following pheromones; i) Disparlure ii) Bombykol

3+3+4

2A. Justify the following statements;

i. Icaridin is preferred over DEET as an insect repellant.
ii. Pyrimidines are resistant to electrophilic substitution reactions.
iii. Abscisic acid is an important phytohormone.

2B. What are carbamate pesticides? Explain the synthesis and uses of Baygon and Aldicarb.

2C. Discuss the following;

i. Nucleophilic substitution reaction of indole
ii. Reduction of benzofuran
iii. Fischer indole synthesis
iv. Tishchenko reaction of furfural

3+3+4

3A. Explain the electrophilic substitution of pyridine taking bromination as example.

3B. What are juvenile hormones? Give one example for a synthetic analogue of juvenile hormone and explain its synthesis. What is its role in agrochemistry?

3C. Explain the following;

i) Paal-Knorr synthesis of thiophene ii) Bamberger triazine synthesis.

3+3+4

4A. Starting with suitable unsaturated compound, how do you prepare (a) 1,1-dihalide (b) 1,2-dihalide (c) mono halide (d) alkane (e) α-haloaldehyde and (f) acyl halide.

4B. An organic compound "A" can be converted to "B" using the reagent "C". But "C" cannot convert "D" to "E". Identify "A" to "E".

Reagent	A	B	D	E
Bromine water	Yes	Yes	Yes	No
Lucas reagent	No	Yes	No	No
2,4 DNP	Yes	No	No	No

4C. Give reason:

(i) $LiAlH_4$ is less selective than $NaBH_4$

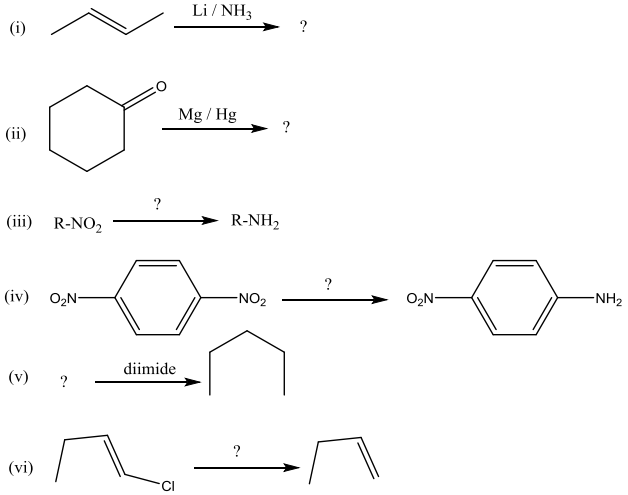
(ii) Primary alcohols oxidation with dichromate gives multiple products

(iii) An organic molecule which answers positively with Lucas reagent, when treated with LTA, need not give the product which answers positively with 2,4 DNP

(iv) $C_6H_5COCH_3$ when treated with peroxide gives C_6H_5-OCO-CH_3 and not C_6H_5-COO-CH_3

3+3+4

5A. Write the appropriate substrate / reagent / product:



5B. An organic molecule "A" reacts with "X" to give "B". The same reaction can also be brought by another reagent "Y". When the compound "A" is treated with 'Z", the products obtained are "C" and "D". Identify "A" to 'D" and "X" to "Z".
Given that: Only A gives positive test with bromine water. Only B gives positive test with lucas reagent. Both C and D gives positive test with 2,4 DNP.

5C. Explain four methods of probing the reaction dynamics

3+3+4

6A. An organic molecule "A" decolorizes bromine water. When "A" is treated with "X", gives the product "B", which answers positively for Lucas reagent. When "B" is treated with "Y" gives the product "C" and "D" which answers positively for 2,4DNP. Identify "A" to "C", "X" and "Y"

6B. Explain generation and chemical reactions of nitrenes

6C. What are hydride donors? How they are different from hydrides. Is Bu3SnH less reactive than NaBH4? Justify your answer with suitable chemical reaction.

3+3+4

*****