

M.SC DEGREE (CSS) EXAMINATION, APRIL 2015  
SECOND SEMESTER – CORE COURSE (CHEMISTRY)  
CHE2ORM – ORGANIC REACTION MECHANISM

Time: 3 Hrs

Maximum.Weight: 30

**PART A****I. (Answer any TEN questions. Each question carries a weight of 1)**

1. Nucleophiles are classified on the basis of donor atoms. Comment?
2. The hydroxylation of 2(Z)-butene leads to meso product. Explain
3. Why do carbonyl compounds undergo nucleophilic addition rather than electrophilic addition.
4. Enolates are better nucleophiles than enols. Why?
5. What are non-classical carbocations. Give examples.
6. What is Dienone – phenol rearrangement.
7. In a haloarene when halogen is on a labelled carbon, we get two products. Explain the product formation.
8. Explain with examples insertion reactions of carbene.
9. Comment on acid catalysed rearrangement of Hydroperoxides.
10. What happens when a ketone is treated with peracids?
11. When a molecule is photochemically excited, what are the changes to ground state HOMO and LUMO?
12. What are Chelotropic reactions – Give an example.
13. What are [2+2] cycloaddition reactions – give an example.

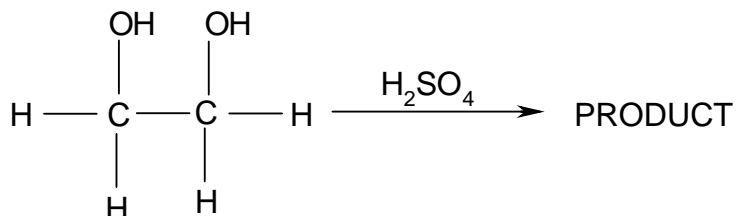
(10 x 1 = 10)

## PART B

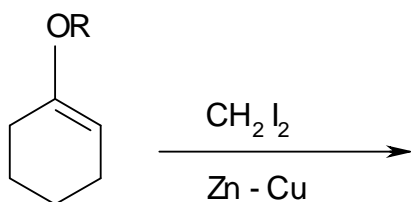
II. (Answer *FIVE* questions by attempting not more than 3 questions from each bunch. Each question carries a weight of 2)

### Bunch 1 (Problem type)

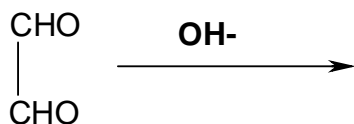
14. Explain with mechanism -



15. Explain with mechanism -



16. Suggest suitable mechanism -



17. During  $\text{S}_{\text{N}}1$  reactions racemization takes place while during  $\text{S}_{\text{N}}2$  reactions, inversion of configuration takes place. Explain?

### BUNCH 2 (Short essay type)

18. What are HOMO and LUMO - Explain using 1,3,5 - Hexatriene.

19. Represent the conrotatory (thermal) ring opening of trans-3,4-dimethylcyclobutene.

20. Free radical addition to alkenes can lead to polymerisation. Explain?

21. Explain Knoevenagel condensation and mechanism involved with a suitable example.

(5 x 2 = 10)

## PART C

### III. (Answer any *TWO* questions. Each question carries a weight of 5)

22. Explain with mechanism and application

- |                         |                           |
|-------------------------|---------------------------|
| a) Acyloin condensation | b) Dieckmann condensation |
| c) Shapiro condensation | d) Darzen condensation    |

23. Explain with mechanism and applications –

- |                      |                              |
|----------------------|------------------------------|
| a) Mannich Reaction  | b) Wolf – Kishner reduction. |
| c) halolactonization | d) Noyori annulation         |

24. Explain with mechanism and applications –

- |                          |                          |
|--------------------------|--------------------------|
| a) Curtius Rearrangement | b) Schmidt Rearrangement |
| c) Lossen Rearrangement  | d) Wolff Rearrangement   |

25. a) Explain the stereochemistry of addition between cyclopentadiene and maleic anhydride.

b) Explain with suitable examples intermolecular and intramolecularene reactions.

(2 x 5 =10)