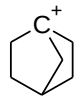
D2ACH2003 **(2 Pages)** **Name.....**
Reg.No.....

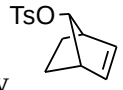
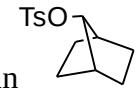
SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2021
CHEMISTRY
FCHE2C07: REACTION MECHANISM IN ORGANIC CHEMISTRY

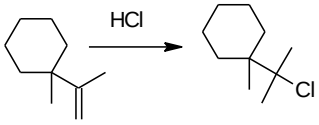
Time: 3 Hours **Maximum Weightage: 30**

Section A: Short answer questions. *All* questions can be answered.
Each carries *one* weightage (Ceiling 6 weightage).

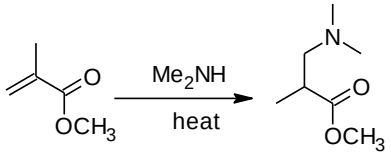
1. Explain the mechanism of S_E1 reaction.
2. What is Claisen condensation? Give an example.
3. Giving mechanism explain Wolf rearrangement.
4. Give an account of Mc Murry coupling.
5. How does an α-halo ester react with an enamine?
6. Which one of the two carbocations is more stable? Why?




7. Give an account of Cannizaro reaction?
8. Of the following related reactions, Hoffmann, Schmidt, Lossen and Curtius, the Lossen rearrangement is the least useful in organic chemistry. Why?
9. Explain Knoevenagel reaction. Give an example.
10. Why  reacts with acetic acid 10^{11} times faster than  ?
11. Explain the reason for formation of the product:



12. Draw the mechanism for the reaction



(PTO)

Section B: Short essay question. *All* questions can be answered.
Each carries *four* weightage (Ceiling 12 weightage).

13. Explain in detail with suitable examples:

    (i) Non-classical carbocations; (ii) Unimolecular elimination reaction (E1).

14. Give a detailed account on kinetic and thermodynamic enolates.

15. Give an account on: (i) Beckmann rearrangement; (ii) Schmidt rearrangement.

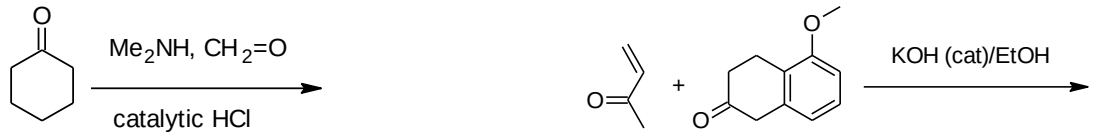
16. (a) What is auto-oxidation?
    (b) Illustrate single electron transfer reaction with an example

17. Predict the products and explain:

(i) (ii)

18. Identify the products and propose a mechanism for its formation:

(i) (ii)



19. Discuss regioselectivity in Markownikoff's and *anti*-Markownikoff's addition.

Section C: Essay questions. *All* questions can be answered.
Each carries *six* weightage (Ceiling 12 weightage).

20. Write the mechanism for:
    (i) Favorski rearrangement (ii) Shapiro reaction
    (ii) Darzen condensation (iii) Wittig reaction.

21. Explain briefly on the effects of substrate and leaving group on nucleophilic substitution reactions.

22. Explain the following:
    (i) Dienone-Phenol rearrangement (ii) Wagner-Meerwein rearrangement
    (iii) Benzilic acid rearrangement (iv) Dakin's reaction

23. Discuss the structure and stability of carbocations, carbanions and nitrenes. Give any two reactions each in which they are involved as intermediates.