

**2020****B.Sc****2<sup>nd</sup> Semester Examination****Sub: Organic Chemistry (Hons.)****Paper: C4 (T+P)****F.M. 20(T) + 10(P)****Time: 2 Hours**

1. Answer any one question
  - a. Draw the energy profile diagram of n-butane for rotation around C<sub>2</sub>-C<sub>3</sub> bond and label the maxima and minima with proper conformations. Is it possible to isolate the different forms? What is gauche butane interaction?
  - b.
    - i. Between p-fluorophenol and p-chlorophenol, which one is stronger acid and why?
    - ii. Compare the extents of enol content of CH<sub>3</sub>COCH<sub>2</sub>COCH<sub>3</sub> in water and in benzene solvents.
  - c. State Hammond's postulate. Draw an energy-profile diagram of a hypothetical two-step exothermic reaction whose second step is slower than the first step but the activation energy of the first step is greater than that of second step. Justify your answer.
  - d.
    - i. Draw Hofmann and Saytzeff transition states for E2 reaction of Me<sub>2</sub>CHCHBrMe in presence of NaOR. Explain how the ratio of Hofmann and Saytzeff products changes with the size of R.
    - ii. Give the complete spectrum of E1-E2-E1CB reaction and explain.
  - e. Reaction of an optically active alcohol with SOCl<sub>2</sub> in presence of 3<sup>o</sup>-amine affords replacement of the hydroxyl group by chloride with inversion of configuration. However, if the amine is omitted, the result is replacement with retention of configuration. Suggest mechanistic explanation.

2. Give the procedure and mention the concerned reaction.  
(Answer any one question)
- Prepare m-dinitrobenzene from nitrobenzene.
  - Prepare benzoic acid from benzamide by hydrolysis.
  - Prepare m-nitro aniline from m- dinitrobenzene by selective reduction.
  - Prepare benzoic acid from benzyl chloride by oxidation.

**N.B.:** Send the answer to the e-mail address-

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