**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(END SEMESTER EXAMINATION)**

**CLASS: MSC/IMSC/PRE-PHD** **SEMESTER : I/VII**
**BRANCH: CHEMISTRY** **SESSION : MO/2022**

**SUBJECT: CH403 & CH403R1 REACTION MECHANISM IN ORGANIC CHEMISTRY**
**TIME: 3:00 Hours** **FULL MARKS: 50**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 10 marks and total 50 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
**5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

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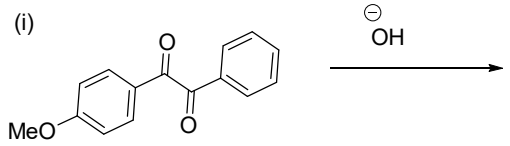
Q.1(a) SE2 (front) reactions are possible at sterically crowded positions such as a bridgehead carbon. (True or False) 2
Q.1(b) What is the rate law for mixed $SN^1$ and $SN^2$ reactions. 3
Q.1(c) Discuss neighbouring group participation by sigma bond with one example. 5

Q.2(a) Write the steps involved in arenium ion mechanism. 2
Q.2(b) Write the stepwise mechanism of Sommelet-Hauser rearrangement reaction. 3
Q.2(c) Write the stepwise mechanism of Vilsmeir-Haack reaction. 5

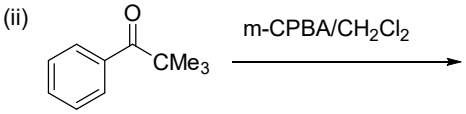
Q.3(a) Give one example of E1cB mechanism. 2
Q.3(b) Discuss the mechanism of acid catalyzed aldol condensation. 3
Q.3(c) Write the stepwise mechanism of Claisen condensation reaction. 5

Q.4 Predict the product and suggest the mechanism for the following reaction (answer any four questions) 2.5x4=10

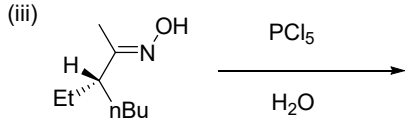
(i)



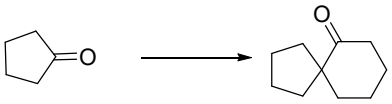

(ii)



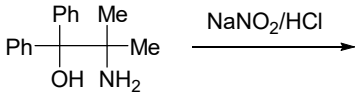

(iii)



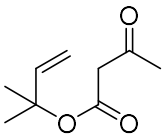

(iv)



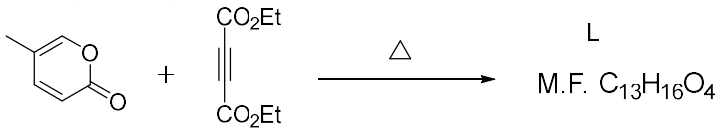

(v)




Answer any five questions 2
Q.5(a) Write down the product of the following reaction which follows [3,3] -sigmatropic pathway and justify




Q.5(b) Identify L in the following and explain its formation 2

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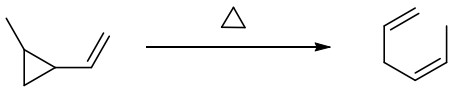
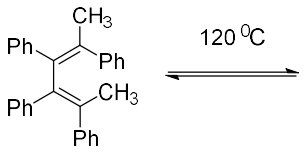
Q.5(c) Account for the following observation 2

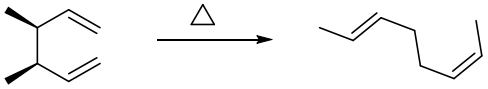


Q.5(d) Explain Claisen rearrangement as a [3,3]-sigmatropic reaction. 2

Q.5(e) Predict the product of the following reaction from FMO considerations: 2




Q.5(f) Explain the following thermal reaction 2



**:::::23/11/2022:::::E**