

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

CLASS: I. M. Sc./ M.Sc.
BRANCH: CHEMISTRY

SEMESTER: VII/I
SESSION: MO/2023

SUBJECT: CH403R1 REACTION MECHANISMS IN ORGANIC CHEMISTRY

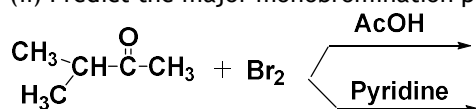
TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

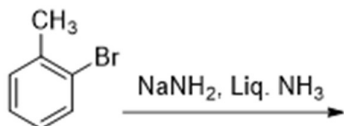
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be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

- Q.1(a) (i) The rate of reaction of 1-bromobutane with azide ion is increased 5×10^3 times on changing a solvent from methanol to acetonitrile. Explain [2+3]
(ii) Predict the major monobromination product in the reactions shown below and explain.



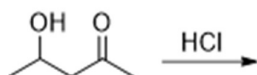
- Q.1(b) (i) $\text{CH}_3\text{CHOHCH}_2\text{SEt}$ and $\text{CH}_3\text{CH}(\text{SEt})\text{CH}_2\text{OH}$ give the same product when treated with dry HCl. Give the structure of the product and explain its formation. [3+2]
(ii) α -chloro carbonyl compounds ($\text{R}-\text{CO}-\text{CH}_2\text{Cl}$) is a very good substrate for S_N^2 reaction. Explain

- Q.2(a) Write the mechanism of following aromatic substitution reaction. [5]



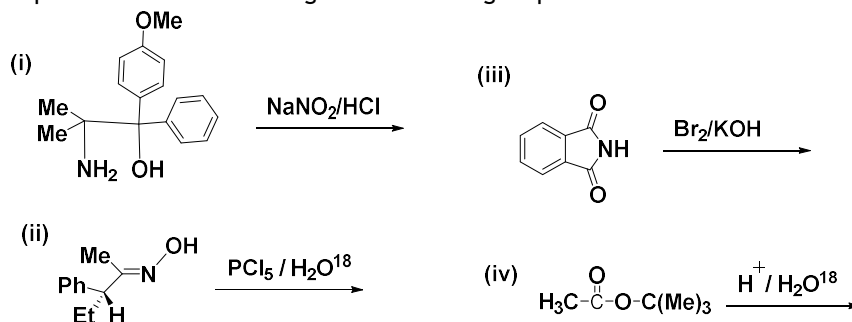
- Q.2(b) Describe Vilsmeier reaction with one example. [5]

- Q.3(a) Discuss the mechanism of following elimination reaction. [5]



- Q.3(b) Describe Claisen condensation reaction with one suitable example. [5]

- Q.4 Predict the products of the following reactions and give plausible mechanism in each case. [4 X 2.5]



- Q.5 Write down the products of the following reactions. explain via FMO approach, [4 x 2.5]

