

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

CLASS: IMSc/MSc/Pre-PhD
BRANCH: CHEMISTRY

SEMESTER : VII/I
SESSION : MO/2025

SUBJECT: CH403R1 REACTION MECHANISM IN ORGANIC CHEMISTRY

TIME: 3 Hours

FULL MARKS: 50

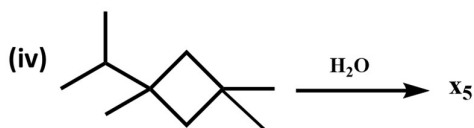
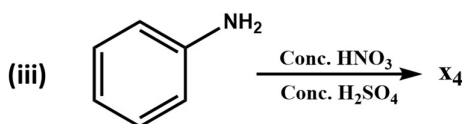
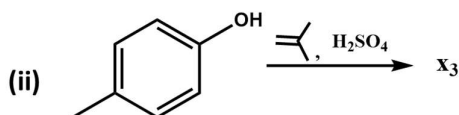
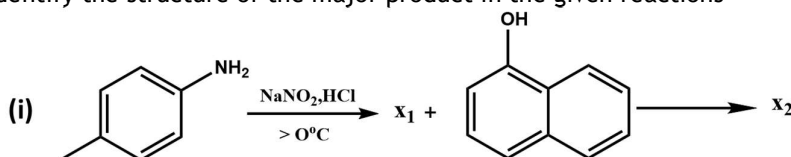
INSTRUCTIONS:

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) Identify the structure of the major product in the given reactions

[5]

CO	BL
2	3

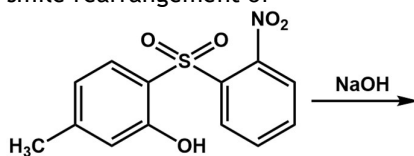


Q.1(b) (i) Why the rate of acetolysis of trans-2-iodocyclohexyl brosylate is 1.7×10^6 faster as compared to its cis-isomer? [5] 2 3

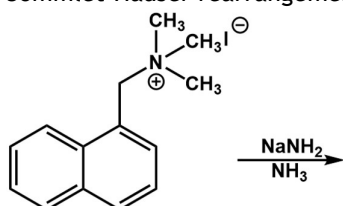
(ii) Discuss the reaction mechanism of nucleophilic substitution of aryl alcohol by Mitsunobu reaction.

Q.2(a) Discuss the mechanism and identify the product for following the rearrangement [2+2+4] 3 3

(i) smile rearrangement of

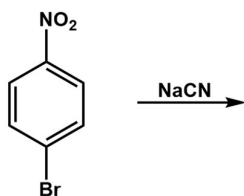


(ii) Sommet-Hauser rearrangement of

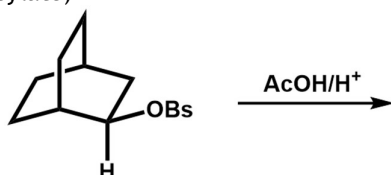


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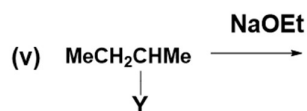
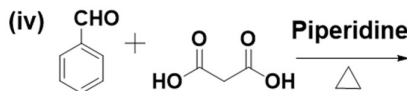
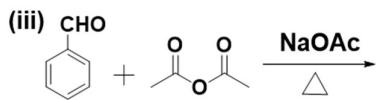
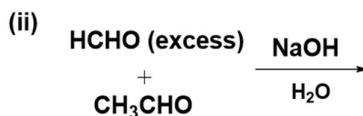
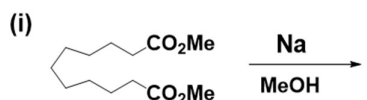
(iii) Von-Richter rearrangement of



Q.2(b) Explain the mechanism of following reaction which yield racemic mixture. (Bs = [2] 2 3
brosylate)

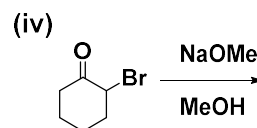
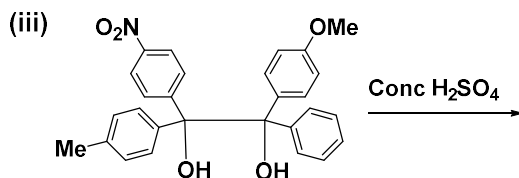
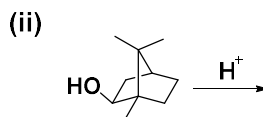
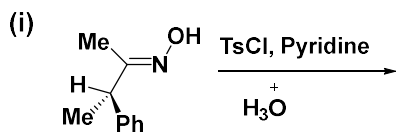


Q.3 Predict the products of the following reactions and give plausible mechanism in each [2x5] 3 3
case



(A) Y= Br
+ Write down the products
(B) Y= NMe₃

Q.4 Predict the products of the following reactions and give plausible mechanism in each [2.5x4] 2 3
case.



Q.5 Write down the products of the following reactions. explain via FMO approach, [2.5x4] 3 3

