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

CLASS: IMSc/MSc **SEMESTER: IMSc VII/MSc I**
BRANCH: CHEMISTRY **SESSION: MO/2024**

SUBJECT: CH403R1 REACTION MECHANISM IN ORGANIC CHEMISTRY

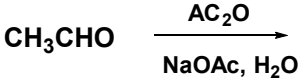
TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:

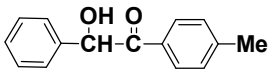
1. **The question paper contains 5 questions each of 10 marks and total 50 marks.**
2. **Attempt all questions.**
3. **The missing data, if any, may be assumed suitably.**
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. **Tables/Data hand book/Graph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

			CO	BL
Q.1(a)	(I) Give the products of the following reactions with plausible mechanism:	[2x2+2]	2	3

(i)

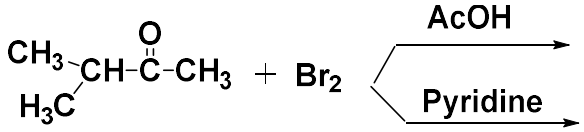


(ii)



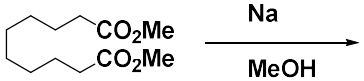
Synthesize *via* Benzoin condensation

(II) Predict the major monobromination product in the reactions shown below and explain.

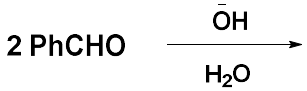


Q.1(b)	Predict the products of the following reactions and give plausible mechanism in each case	[2x2]		

(i)

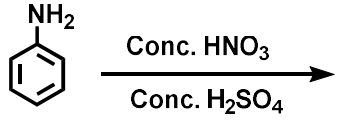


(ii)

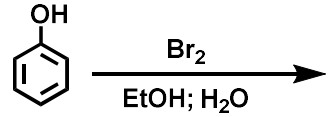


Q.2(a)	Identify the structure of the major product in the given reaction	[5]	1	3

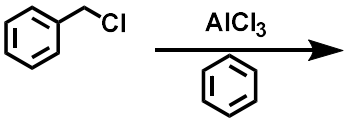
(i)



(ii)

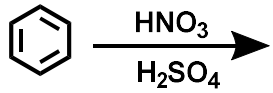


(iii)

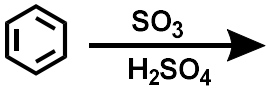


Q.2(b)	Discuss the mechanism and identify the product for following the transformation	[5]	2	3

(i)

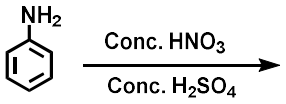


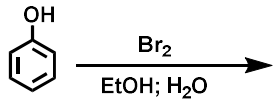
(ii)

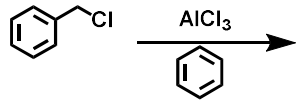


PTO

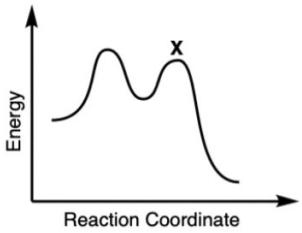
Q.3(a) Draw mechanisms for these reactions, explaining why these particular products are formed. [5] 3 3

(i) 

(ii) 

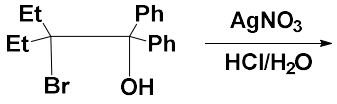
(iii) 

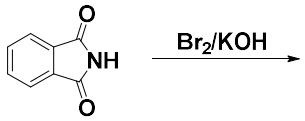
Q.3(b) (i) What structure best represents the X on the reaction coordinate diagram below for an S_N1 reaction and why? [5] 3 3

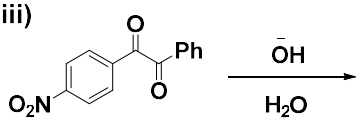


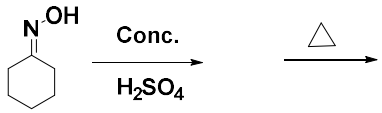
(ii) Discuss the substrate choice and role of the solvent (polar protic and polar aprotic solvent) in S_N1 and S_N2 reactions.

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

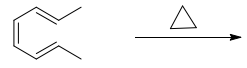
(i) 

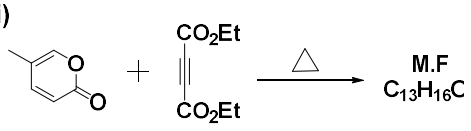
(ii) 

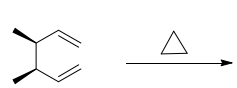
(iii) 

(iv) 

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

(i) 

(ii) 

(iii) 

(iv)