

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

CLASS: IMSC
BRANCH: CHEMISTRY

SEMESTER: VI
SESSION: SP/2020

SUBJECT: IMC6005 ORGANIC CHEMISTRY-II

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

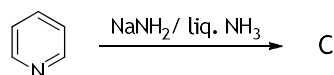
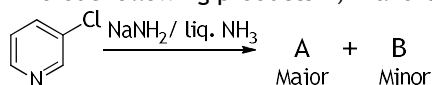
1. The total marks of the questions are 30.
 2. Candidates may attempt for all 30 marks.
 3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. The missing data, if any, may be assumed suitably.
 6. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q1 (a) Discuss the temperature effect on ^1HMR of N,N-dimethylformamide. [2]
(b) Write the principle of ^1HMR spectroscopy. [3]

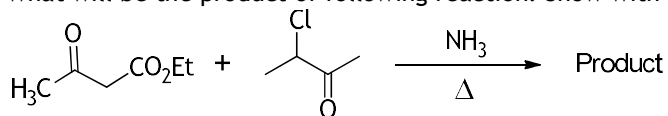
- Q2 (a) Explain the fact that the alkene hydrogen appears at 4-8 ppm while aromatic hydrogen appears at 6-9 ppm. [2]
(b) Elucidate the structure from following spectroscopic data with proper explanation. [3]
Molecular formula: $\text{C}_8\text{H}_8\text{O}$
FTIR (cm^{-1}): 3068; 1686; peaks at 1601, 1451, 1362 and 1268.
 $^1\text{HMR}(\delta)$: 7.60 (multiplet, 2 H); 7.18 (multiplet, 1 H); 7.10 (multiplet, 2 H); 2.18 (singlet, 3 H)

- Q3 (a) Why does the quantum yield is not always unity? Write the correct statement of the photoequivalence law. [2]
(b) With the help of arbitrary energy diagram explain the OBF mechanism for photoisomerization of stilbene. How is the mechanism modified in presence of sensitizer? [3]

- Q4 (a) Why does pyrrole form 2-substituted product as the major one whereas 3-substituted is the major product for pyridine in electrophilic aromatic substitution reaction? [2]
(b) Find out following products A, B and C [3]



- Q5 (a) Why dipole moment of pyrrole is larger than furan? [2]
(b) What will be the product of following reaction? Show with the mechanism. [3]



- Q6 (a) Why does furan take part in Diels-Alder reaction but thiophene rarely does? [2]
(b) Show with mechanism for the product formation when a mixture of glycerol, aniline and sulfuric acid is gently heated in presence of ferrous sulfate in nitrobenzene solvent. [3]