

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

CLASS: IMSC
BRANCH: CHEMISTRY

SEMESTER : VII
SESSION : MO/19

SUBJECT: SAC1003 ORGANIC REACTION MECHANISMS

TIME: 3:00 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 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) How do the following hydroxyl and amino groups protect during organic reactions? [6]
Q.1(b) Write short note on conformation of fused ring compounds (such as decaline). [6]

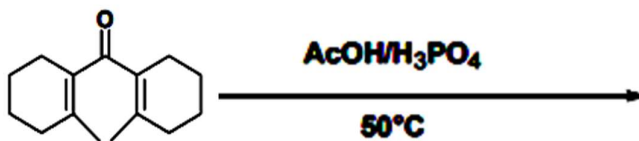
Q.2(a) Discuss the mechanisms of E1 and S_N2 reactions with examples. [6]
Q.2(b) What is free radical? Write short note on the vinyl polymerization. [6]

Q.3(a) Discuss the optical activity of the compounds having two dissimilar stereogenic centers. [6]
Q.3(b) Write the methods of resolution of racemic mixture. [6]

Q.4(a) What is Benzyne intermediate? Give one example of aromatic S_N1 reaction in aromatic ring substitution and discuss the evidence to support this mechanism. [6]
Q.4(b) Draw the labeled comparative energy profile diagram and explain the fact that electrophilic substitution of benzene is favorable over the addition reactions. [6]

Q.5(a) Define nucleophilic radical with example. Explain the order of percentage of ortho, meta and para products obtained for Ph• attack to PhOMe and PhNO₂. [6]
Q.5(b) Explain the photocatalyzed addition of HBr to CCl₃CH=CH₂. Give the mechanism of Sandmeyer reaction with example. [6]

Q.6(a) From the correlation diagram predict the allowed mode of electrocyclic process for 4π system under photochemical condition. Complete the following reaction with mechanism; [6]



Q.6(b) Discuss about the region selectivity of Diels-Alder reaction with example. Unlike [1,3] hydride shifts, [1,7] hydride shifts thermally possible- Justify the statement. [6]

Q.7 Write short note on. [4x3]
a) Ipsso attack
b) Cope rearrangement
c) Auto-oxidation and Anti-oxidant
d) N-Coupled diazocoupling