

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

CLASS: MSC  
BRANCH: CHEMISTRY

SEMESTER : II  
SESSION : SP/19

SUBJECT: CH410 MODERN ORGANIC CHEMISTRY

TIME: 3.00 Hrs.

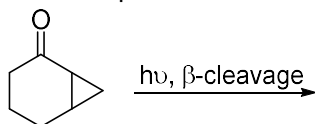
FULL MARKS: 50

**INSTRUCTIONS:**

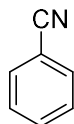
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be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

Q.1(a) Discuss radiative transitions with a properly labeled Jablonski diagram. [5]

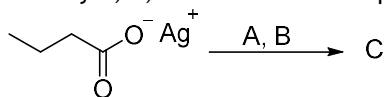
Q.1(b) Write the products formed along with stepwise mechanism. [5]



Q.2(a) How will you synthesize the following compound using Sandmeyer reaction? Write the synthetic steps and stepwise mechanisms. [5]

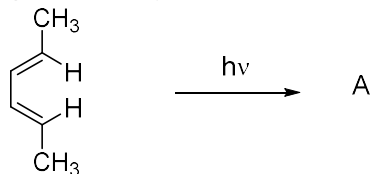


Q.2(b) Identify A, B, C and write the stepwise mechanisms. [5]



Q.3(a) Diels Alder Reactions are thermally allowed process. Explain with MO diagram using FMO approach. [5]

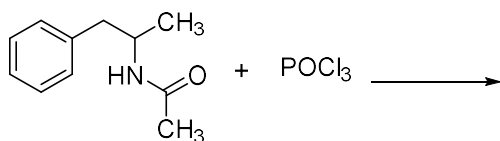
Q.3(b) Identify the product A with stereochemistry from electrocyclic ring closure as per the following reaction. Explain the ring closure mode using MO approach under photochemical condition. [5]



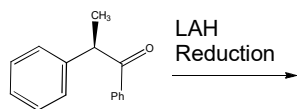
trans,trans-2,4-hexadiene

Q.4(a) Write the structure of coumarin and chromone. Discuss Fischer Indole synthesis with one example and stepwise mechanism. [5]

Q.4(b) Write the product formed and stepwise mechanism of the following reaction involving nitrilium intermediate. [5]



Q.5(a) Draw Cram's and Felkin Anh Model in Newmann projection. Demonstrate the formation of major and minor product from  $\text{LiAlH}_4$  reduction of (R)-1,2-diphenylpropan-1-one. [5] PTO



(R)-1,2-diphenylpropan-1-one

Q.5(b) Explain and draw the reaction sequence to determine the chirality of octan-2-ol (chiral alcohol) using Prelog's Rule. [5]