

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

CLASS: IMSC  
BRANCH: CHEMISTRY

SEMESTER : II  
SESSION : SP/19

SUBJECT: CH108 ORGANIC CHEMISTRY-I

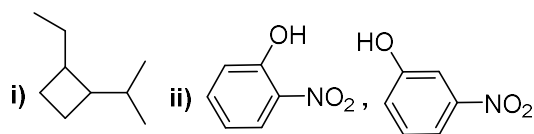
TIME: 3.00 Hrs.

FULL MARKS: 50

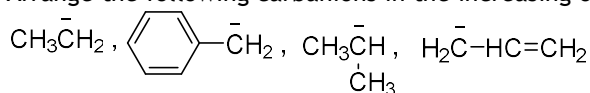
**INSTRUCTIONS:**

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.
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- Q.1(a) i) Write the IUPAC name of the following molecule. ii) Which of the following phenols is more acidic? Explain. iii) Discuss the structure and shape of a carbocation. [1+2+3]

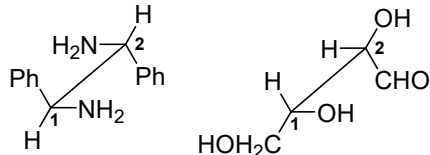


- Q.1(b) Arrange the following carbanions in the increasing order of stability and justify your answer. [5]

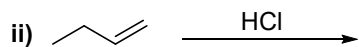
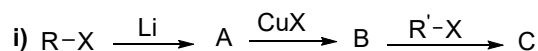


- Q.2(a) a) What is optical isomerism, explain with examples. b) Draw the stereochemical structure of Tartaric Acid. Explain and correlate their structures to explain enantiomer, diastereomer and meso compound. [5]

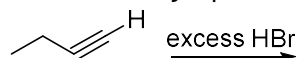
- Q.2(b) a) Convert the following Sawhorse formula to Newman and to Fisher Projection Formula. b) Identify R/S, D/L and Erythro/Threo Isomerism using its Fisher Projection Formula. [5]



- Q.3(a) i) Write the products (A, B, C) formed from the following reaction. ii) Write the stepwise mechanism of the following reaction. iii) The rate of E2 depends on concentration of base. True or false? [1.5+2.5+1]



- Q.3(b) Discuss the major product formed and stepwise mechanism of the following reaction. [5]



- Q.4(a) i) Explain the stability of cycloalkanes in comparison to open chain compound based on heat of combustion. ii) What is banana bond, explain with orbital diagram. [2+3]

- Q.4(b) i) Explain the major fact, which is associated for the instability of boat conformation of cyclohexane. ii) Demonstrate the conformational flipping of trans-1,2-dimethyl cyclohexane. [2+3]

- Q.5(a) Explain the theoretical and experimental perspectives of aromaticity in benzene. [5]

- Q.5(b) i) Explain the aromatic/anti-aromatic/non-aromatic nature of the following compounds:  $\text{C}_9\text{H}_{10}$ ,  $\text{C}_9\text{H}_9^+$  and  $\text{C}_9\text{H}_9^-$ . ii) Draw the reaction mechanism of nitration of benzene. [3+2]