Birla Institute of Technology & Science, Pilani, Rajasthan 333 031 First Semester 2023-2024

MID-SEMESTER EXAMINATION CHEM F311 ORGANIC CHEMISTRY-III

Time: 90 Minutes Max. Marks: 50 Date: 14/10/23

There are four questions in all. All questions are compulsory. Answer the sub-parts of a question together.

Q. No. 1. (i). Propose **three** different forward synthetic strategies (a-c) to prepare the given target molecule (X), starting from substituted furan derivatives and using CO_2 as one of the partner. Show all reagents/sub-steps involved in the three requisite chemical strategies. [2.5+2.5+2.5=7.5]

(ii). Label the following synthons using $acceptor^{(0,1,2,3...)}/donor^{(0,1,2,3...)}$ notation, and write their corresponding synthetic equivalents. [1+1+0.5=2.5]

(a)
$$\bigoplus$$
 (b) \bigoplus (c) $\mathbb{R}^{-\frac{1}{2}}$

Q. No. 2. Suggest a retrosynthetic analysis for each of the following target molecules. In each case, identify the type of disconnection. Suggest suitable synthons and synthetic equivalents. (Forward synthesis will not evaluative) [6+4=10]

(i). NC OMe O₂N (ii).
$$S$$
 t_{Bu}

Q. No. 3. Identify the final product for the following chemical transformations, and propose detailed mechanisms for their formation. [5+5+5]

(i). Br
$$O$$
 + O Pd(OAc)₂ (5 mol %) O Cul (5 mol%) O P(2-furyl)₃ (10 mol %) O Cs₂CO₃, CH₃CN, 60 °C, 12 h

......page 1/2.....

Q. No. 4. Identify the structures of A-J for the following transformations. (*No mechanism required*)[1.5x10=15]

.....page 2/2.....