# Birla Institute of Technology \& Science, Pilani, Rajasthan 333031 <br> First Semester 2023-2024 <br> MID-SEMESTER EXAMINATION <br> CHEM F311 ORGANIC CHEMISTRY-III <br> Max. Marks: 50 

Time: 90 Minutes
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 ( $\mathbf{X}$ ), starting from substituted furan derivatives and using $\mathrm{CO}_{2}$ 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 ${ }^{(0,1,2,3 \ldots)} / \operatorname{donor}^{(0,1,2, \ldots)}$ notation, and write their corresponding synthetic equivalents.
$[1+1+0.5=2.5]$
(a)

(b)

(c) $\mathrm{R}^{-\oplus}$
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).

(ii).

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

(ii).


(iii).


$$
\xrightarrow[\substack{\mathrm{H}_{2} \mathrm{O}_{2}(1 \text { equiv }), \\ \text { DCM, r.t., } 10 \mathrm{~h}}]{\mathrm{SeO}_{2}(20 \mathrm{~mol} \%)}
$$

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

 DCM, r.t., 12 h
(ii).


B


(iv).


(v).


(vi).


(vii).


(viii).

H

(ix).


(x).


$\mathrm{EtOH},-78{ }^{\circ} \mathrm{C}, 1 \mathrm{~h}$

