

# BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

First Semester 2023-2024

Midsemester Examination (Closed Book)

Course Name: Retrosynthetic Analysis

Course No: PHA G618

Total Marks: 30

Date: 11-10-2023

Duration: 90 Min

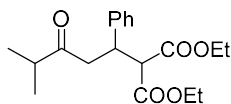
**Instructions:** a) All questions are compulsory; b) Give the answers for all sub-parts together in one place; c) Figures to right in square bracket indicates maximum marks; d) Handwriting should be legible

1) Briefly explain the following with an example. [10]

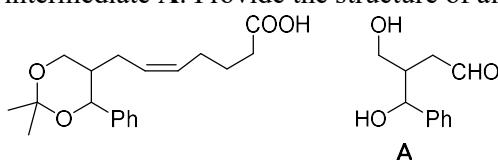
a) Disconnection, (b) Reconnection, (c) Retron, (d) Umpolung e) synthesis of alcohols using 1,2-diX disconnection

2) Provide one-carbon and two-carbon acyl anion equivalents widely used as umpolung in retrosynthesis. Also give an example of their application. [4]

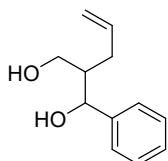
3) Disconnect the following target molecule using 1,5-diCO approach until it leads to the *benzaldehyde* as one of the starting materials. Draw the synthetic equivalents for all steps. [4]



4) Following molecule is required for the synthesis of thromboxane drug. Provide its retrosynthesis leading to the intermediate **A**. Provide the structure of all synthetic equivalents. [4]



5) identify 1,3-diCO relationship in the following molecule and use it for the retrosynthesis leading to allyl bromide as one of the starting materials. [2]



6) a) With the help of forward synthesis explain how alkynes can be used to make a molecule with a 1,4-diol system.  
b) Also show the synthons and retrosynthetic scheme for the same. [4]

7) Two retrosynthesis can be designed to make following amine using reductive amination. Provide both disconnections and corresponding starting materials. [2]

