

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

First Semester 2022-2023

Comprehensive Examination (Open Book)

Course Name: Retrosynthetic Analysis

Course No: PHA G618

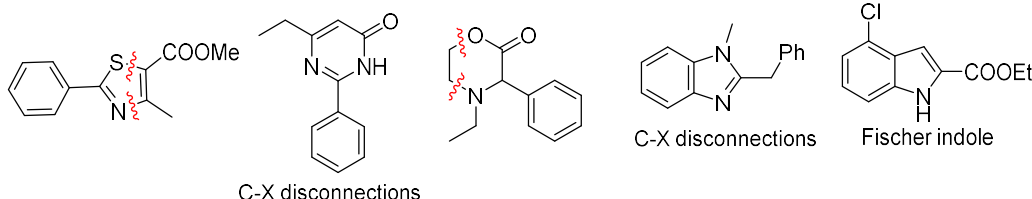
Total Marks: 25

Date: 23-12-2022

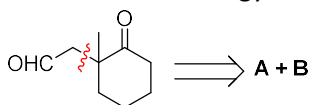
Duration: 2.5 h (maximum)

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 e) All rough work must be done on the last sheet.

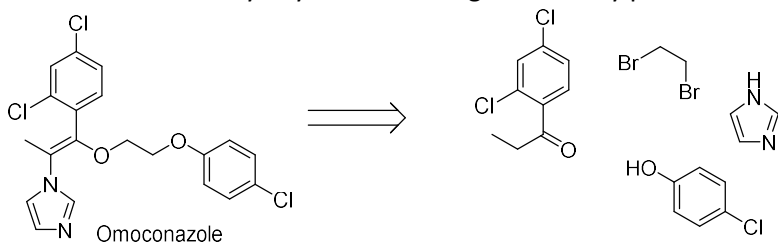
1) Provide the starting materials for the synthesis of following heterocyclic rings using the given suggestions. [5]



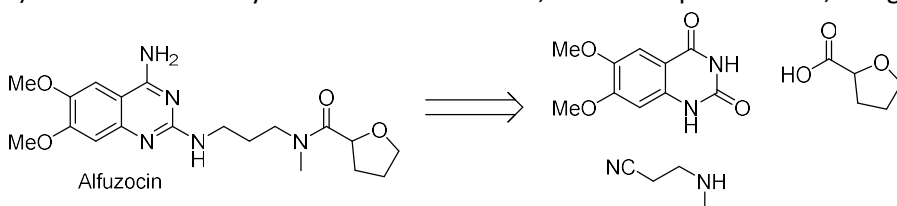
2) A chemist suggested 1,4-diCO disconnection for making the following target compound. Provide the synthons and synthetic equivalents of **A** and **B**. What problem you might face during the synthesis and how it can be solved using reconnection strategy. [5]



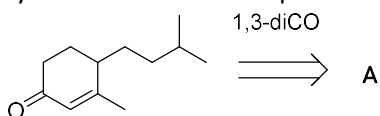
3) Provide the retrosynthesis of the antifungal drug omoconazole leading to the starting materials given on the right side of the arrow. Identify any chemo- or regioselectivity problem during the synthesis and provide its solution. [4]



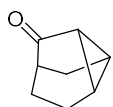
4) Provide the retrosynthesis of the alfuzocin, an α_2 receptor blocker, using the provided building blocks. [4]



5) For the synthesis of following cyclic ketone 1,3-diCO disconnection can be suggested. However, in the forward synthesis another side-product **B** was obtained. Provide the structures of **A** and **B** and explain the formation of **B**. [3]



6) the 3-membered ring in the following tricyclic ketone can be disconnected in three ways using carbene chemistry. Provide the starting materials for all three disconnections and explain which one would you prefer? [4]



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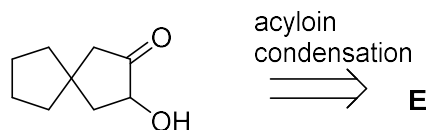
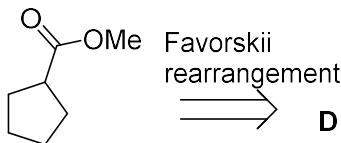
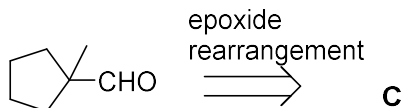
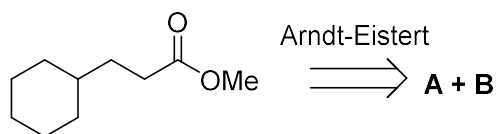
Total Marks: 10

Date: 23-12-2022

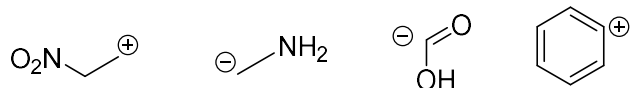
Duration: 0.5 h (minimum)

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 e) All rough work must be done on the last sheet.

1) Provide the structures of A-E in the following retrosynthetic name reactions. [5]



2) Provide synthetic equivalents of the following synthons. [2]



3) Identify typical retrons in the following target structures and suggest appropriate transforms with synthetic equivalents. [3]

