



EASTERN UNIVERSITY, SRI LANKA

THIRD YEAR FIRST SEMESTER EXAMINATION IN SCIENCE – 2021/2022 (Aug/Sep-2024)

CH3021: HETEROCYCLIC CHEMISTRY AND REARRANGEMENT REACTIONS

Answer **all** questions

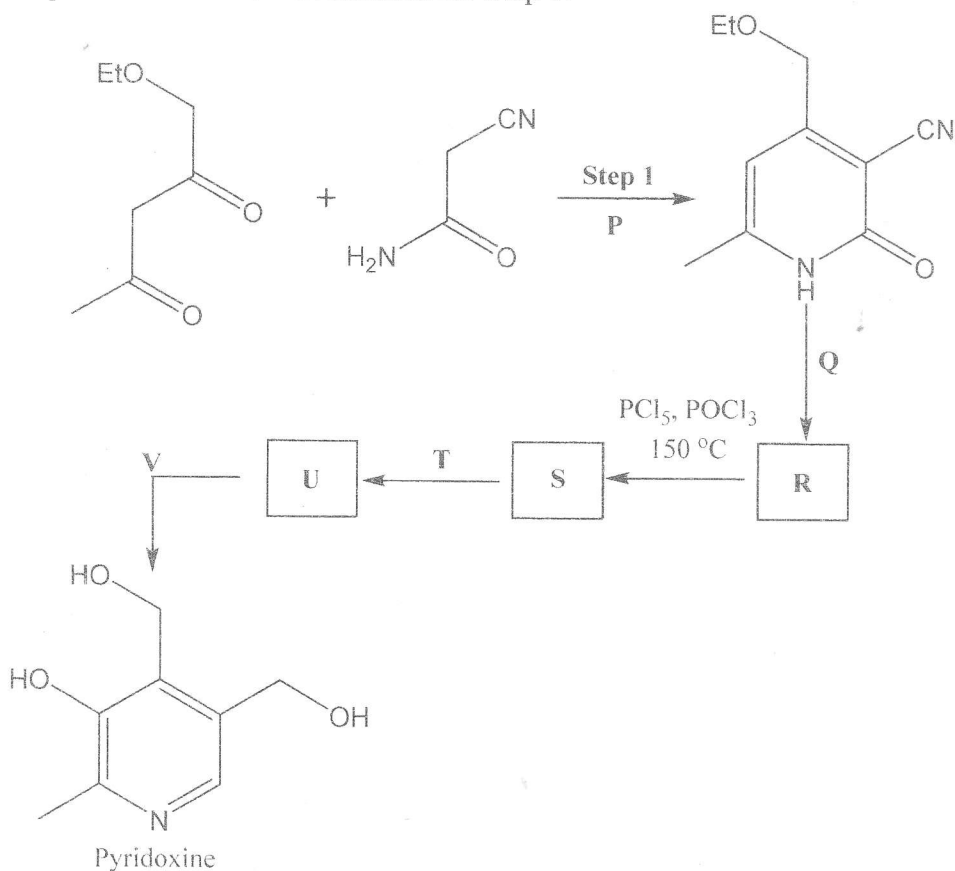
Time: **01** hour

1) a) Pyridoxine can be synthesized from enamine equivalents as shown in the scheme below.

i) Predict the products and reagents involved in each step of the synthesis.

(25 marks)

ii) Suggest a plausible reaction mechanism for Step 1.



(15 marks)

b) Explain the following observations.

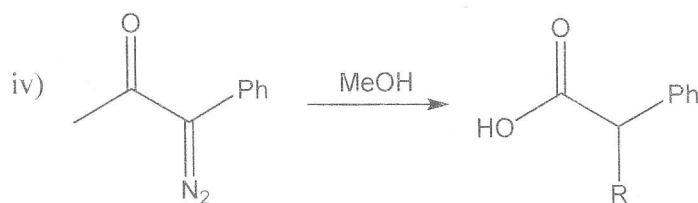
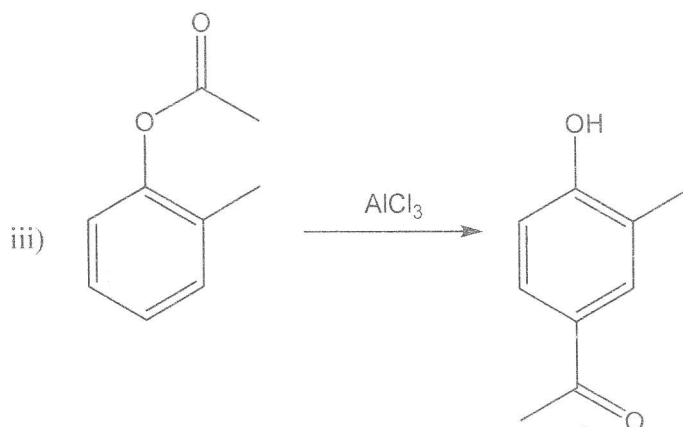
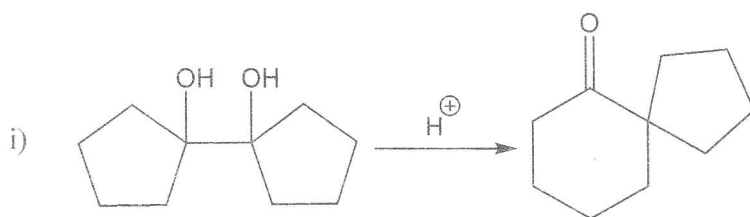
i) Thiophene shows more aromatic character than furan and pyrrole.

(10 marks)

ii) The nitration of quinolone with fuming nitric acid in concentrated sulphuric acid gives a mixture of 5-nitroquinolone and 8-nitroquinoline.

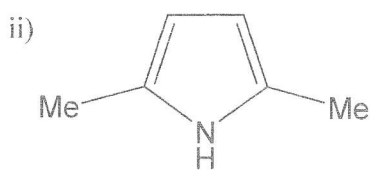
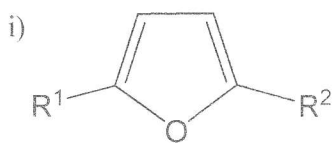
(10 marks)

c) Suggest plausible mechanisms for the following rearrangement reactions.



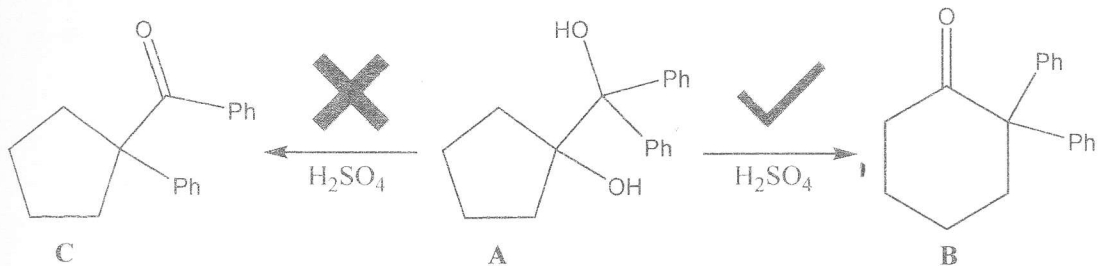
(40 marks)

2) a) How would you synthesize the following heterocycles. For each synthesis provide suitable reaction conditions and mechanisms.



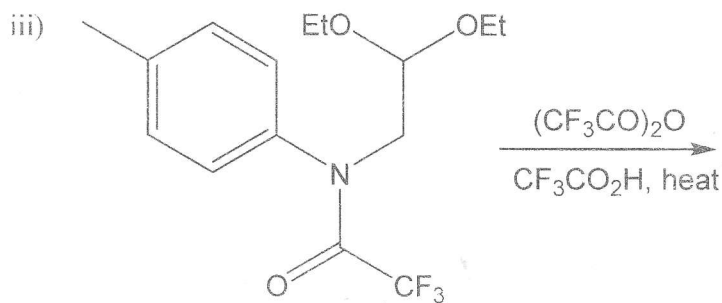
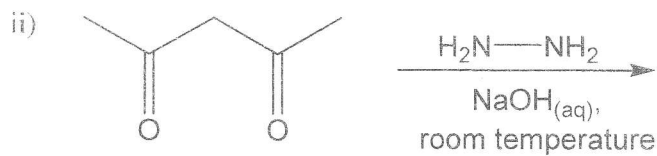
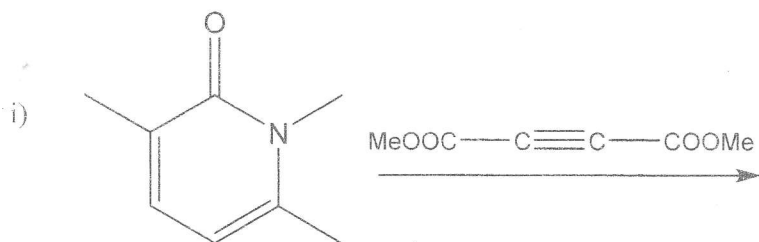
(40 marks)

b) Why compound "A" can undergo semipinacole rearrangement and give "B" and not "C" (justify your answer with a plausible mechanism).



(30 marks)

c) Predict the product(s) formed in the following reactions (mechanisms not necessary).



(30 marks)

.....End of paper.....