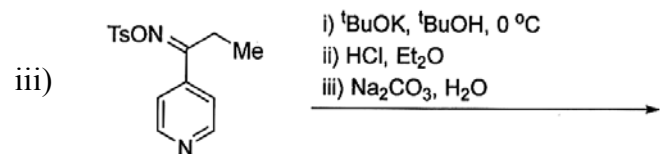
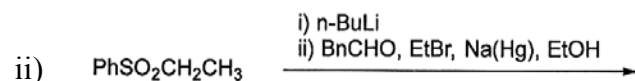
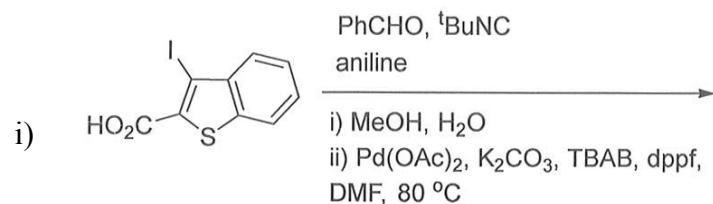


[4]

- b) Discuss the Appel reaction for the conversion of alcohols to alkyl chlorides by using catalytic amount of triphenyl phosphine and other suitable reagents mentioning the reaction condition. Explain the mechanism with an example. $2\frac{1}{2}$
2. a) Mention a role of TEMPO in organic synthesis. Show a plausible mechanistic route involved in a TEMPO mediated conversion of primary alcohol. $1\frac{1}{2} + 1\frac{1}{2}$
- b) Mention a suitable route to access 3, 4-dihydropyrimidin-2(1*H*)-ones from urea showing the mechanistic approach. 2
- c) Predict the product(s) with plausible mechanism: 2×3



Ex/SC/CHEM/PG/CORE/TH/X-AO-1/2023(S)

M. Sc. CHEMISTRY (SPECIAL SUPPLEMENTARY)

EXAMINATION, 2023

(3rd Semester)

PAPER: X-AO-1

[ANALYTICAL CHEMISTRY (A1)+ORGANIC CHEMISTRY (O1)]

Time : Two Hours

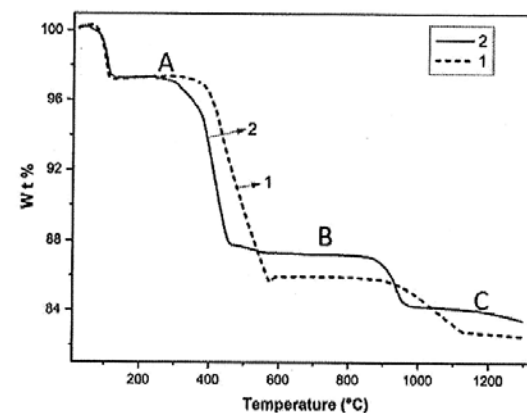
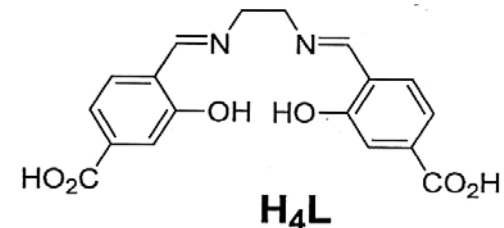
Full Marks : 40

(20 marks for each Unit)

Use a separate answer script for each Unit.

UNIT – 310-A-1

1. a) The TGA of $[\text{Na}_4(\text{LM})_2 \cdot 9\text{H}_2\text{O}]_n$ [$\text{M}=\text{Ni}$ for 1 and Cu for 2] are given below:



[Turn over

[2]

Where, 1: A = 12.14% 2: A = 12.87%

B = 37.67% B = 39.98%

C = 24.97% C = 25.49%

Discuss the TGA curve and also comment on the end product(s).

- b) State any two differences between continuous X-ray and characteristic X-ray generation.
 - c) Write any two differences between crystalline solids and amorphous solids. 6+2+2
2. a) Name the microscopic and macroscopic techniques used for different sample analysis.
 - b) Write the full form of the following sophisticated tools and explain their importance toward analysis. (i) DLS and (ii) FE-SEM
 - c) What are the advantages of electron microscope (EM) over light microscope (LM)?
 - d) Why are Au or Pt coatings very important for biological samples/non-conducting samples during SEM analysis?
 - e) Why does peak shift take place in PXRD analysis of Fe₂O₃ samples when Au-nanoparticles are doped in it? 2+2+2+2

[3]

UNIT – 310-O-1

1. a) Predict the product(s) with proper stereochemistry mentioning the major product of the following reactions and explain with plausible mechanism (Answer any **three**). 2½×3

