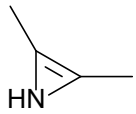
Birla Institute of Technology & Science, Pilani, Rajasthan 333 031
Second Semester 2017-2018
MID-SEMESTER EXAMINATION
CHEM F342 ORGANIC CHEMISTRY-IV

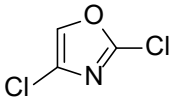
Time: 90 Minutes **Max. Marks: 60** **Date: 09/03/18**

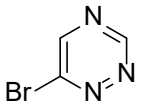
All questions are compulsory. Answer the sub-parts of a question together.

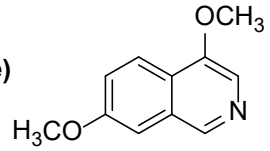
Q. No. 1. (i) Write the IUPAC nomenclature names for the following heterocycles. [6x1.5=9]

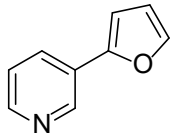
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

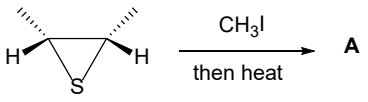
(ii) Arrange the following heterocycles in the increasing order of the property mentioned in brackets. [3x2=6]

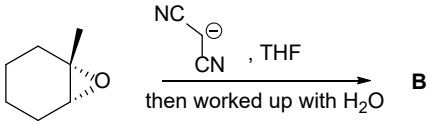
a) Thiophene, Pyrrole, Furan, Indole *[Resonance Energy]*

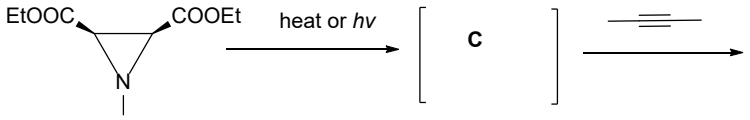
b) Pyridine, Pyrrole, Furan, Thiophene *[Reactivity towards Electrophilic Substitution Reaction]*

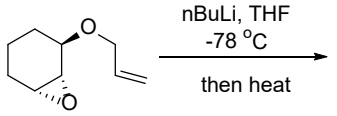
c) Thiophene, Pyrrole, Benzene, Furan *[Dipole moment]*

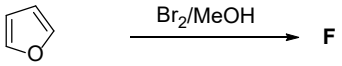
Q. No. 2. Identify the structures of **A-J** (*with correct stererochemistry, wherever applicable*) for the following transformations. (*No mechanism required*) [10x1.5=15]

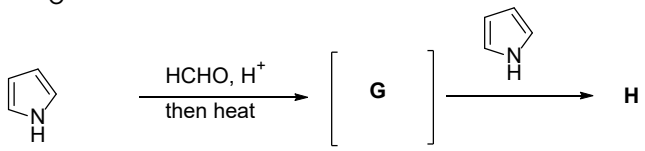
(i) 

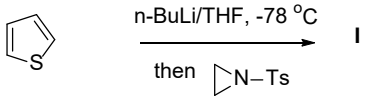
(ii) 

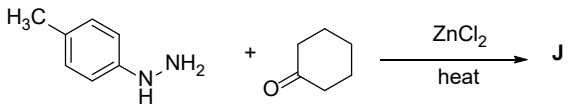
(iii) 

(iv) 

(v) 

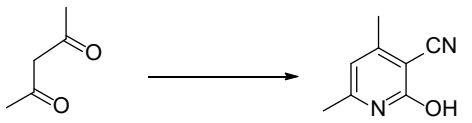
(vi) 

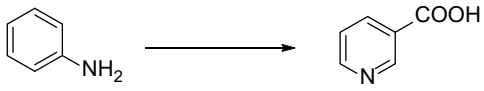
(vii) 

(viii) 

Q. No. 3. (i) Electrophilic substitution in pyrrole takes place at C-2 position, while in pyridine at C-3 position. Explain? [5]

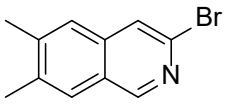
(ii) Using appropriate reagents/solvents, carry out the following conversions: [4+6=10]

(a) 

(b) 

Q. No. 4. Complete the reactions and propose a detailed mechanism for the following organic transformations. [3x5=15]

(i)

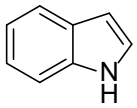


$NaNH_2$ / liq. NH_3

-78 °C

then warm

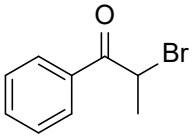
(ii)

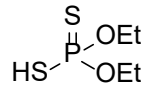


$POCl_3$, DMF

then CH_3COONa, H_2O

(iii)



(a)  , THF

(b) $NaBH_4$-Al_2O_3

(c) heat