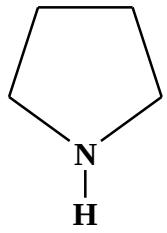
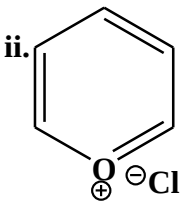
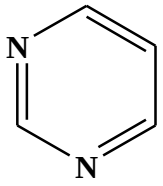
DEPARTMENT OF CHEMISTRY
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SECOND SEMESTER EXAM 2018/2019 SESSION
COURSE CODE: CHM 325 **COURSE TITLE:** Heterocyclic Chemistry
TIME ALLOWED: 2 Hours
INSTRUCTIONS: Answer Question1 and any other two (2) Questions

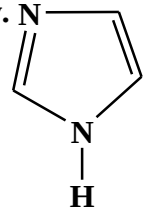
Q1a. Benzene C_6H_6 is highly unsaturated, but does not decolourise bromine water (unlike C_6H_8 or C_6H_{10}).
i. Give reason(s) for this observation.
ii. State the laws governing this phenomenon
iii. Graphically explain this behaviour in C_4, C_5 and C_6 annulenes (cyclic unsaturated compounds).
iv. Is pyrroles C_4H_5N aromatic

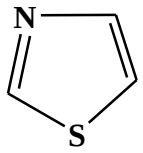
b. Name the following heterocyclic compounds:

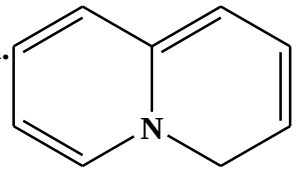
i. 

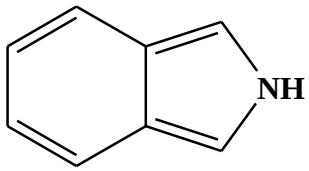
ii. 

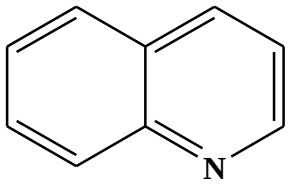
iii. 

iv. 

v. 

vi. 

vii. 

viii. 

1ci) Inspection of the structures of the top-selling drugs globally contains heterocycles, identify and name the heterocyclic compound(s) in each of the following drugs: quinine, tagament, penicillin G and viagra; ii) what are the medical uses of these drugs?

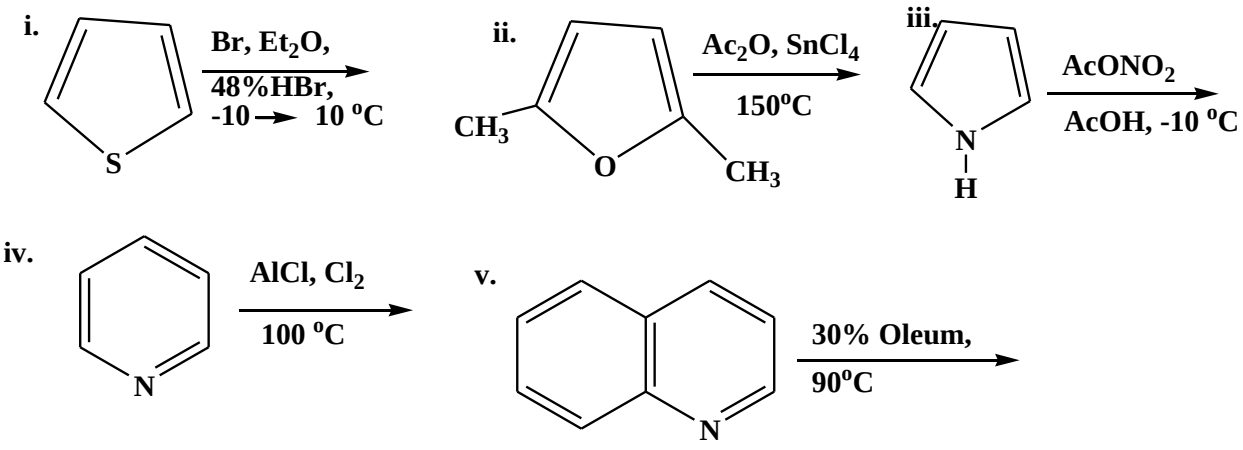
Q2a) What are the four properties exhibited by the structures of furans, pyrroles and thiophenes that are in agreement with those of cyclopentadienyl anion?

b. Starting with 1, 4-diketone and ammonia outline the synthetic pathway for the production of pyrrole using Paal Knorr Synthesis ("4+1").

Q3a. Account for the mechanism of bromination of furan

b. List five ways to show how the lone pair of electrons on the nitrogen atom in pyridine behaves.

Q4 (a). Provide the product for the following reactions:



b. List out three (3) synthetic methods each used in the production of quinolines.