

SC

[100 / A-77]

No of Printed Pages: 04

SARDAR PATEL UNIVERSITY
M.Sc. Semester - III (Organic Chemistry) Examination
Saturday, 9th April 2016
PS03C ORC03: Heterocyclic Chemistry

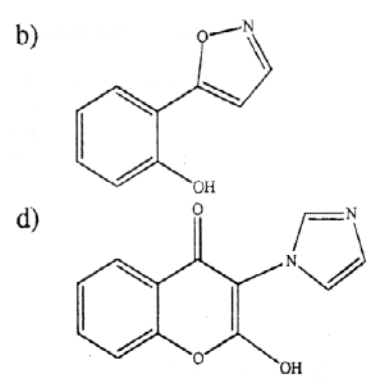
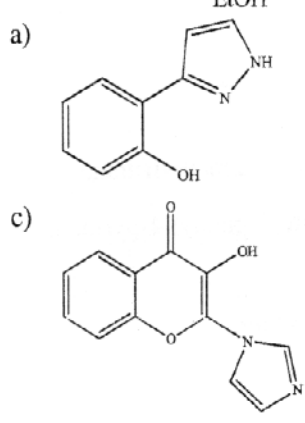
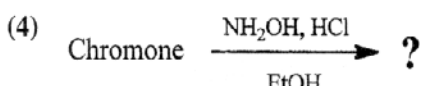
Time: 02:30 pm to 05:30 pm

Maximum Marks - 70

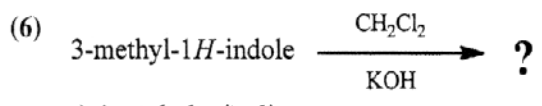
Note: Right hand figures indicate marks.

Q.1 Select the correct answer from the option given below for each of the following questions. Write **ONLY ANSWERS** in the provided answer book. [e.g. Q.1 (1)-(a)] [08]

- (1) Which of the following diazine is a more basic compound in character?
 - a) 4-methylpyrimidine
 - b) 4-methoxypyrimidine
 - c) pyrimidine
 - d) 4-methoxy-6-methylpyrimidine
- (2) 2,4,6-trimethyl pyrylium salt upon reaction with cyanide ion gives _____.
 - a) 1-cyano-3,4-dimethyl benzene
 - b) 1-cyano-2,4-dimethyl benzene
 - c) 1-cyano-3,5-dimethyl benzene
 - d) 1-cyano-2,3-dimethyl benzene
- (3) Which of the following sentence is not correct for pyridine?
 - a) it is thermally and photo chemically stable
 - b) highly reactive towards electrophillic species
 - c) it is basic due to the lone pair of electrons on nitrogen atom
 - d) it is less nucleophilic then benzene

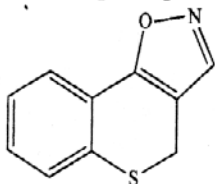


- (5) Which of the following diazaphthalene have two nitrogen atoms present in a different ring system?
 - a) benzopyridazine
 - b) benzopyrazine
 - c) naphthyridiene
 - d) phthalazine



- a) 4-methylquinoline
- b) 3,4-dimehtylquinoline
- c) 3-mehtylquinoline
- d) 2,4-dimehtylquinoline

(7) Which is the correct name of the following compound,



- a) 4*H*-benzothiopyrano[3,4-d]isoxazole b) 2*H*-benzothiopyrano[3,4-d]isoxazole
 c) 4*H*-benzothiopyrano[3,4-b]isoxazole d) 4*H*-benzothiopyrano[4,5-d]isoxazole

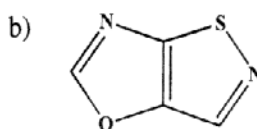
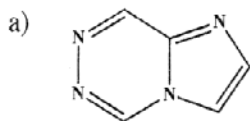
(8) 6-hydroxy quinoline upon reaction with chloroform in presence of base gives ____.

- a) 5-formyl-4-hydroxyquinoline b) 4-formyl-6-hydroxyquinoline
 c) 5-formyl-6-hydroxyquinoline d) 6-(trichloromethyl)quinoline

Q.2 Answer **ANY SEVEN** of the following

[14]

1. "Pyridine is weak base than methyl amine" Justify.
2. Give complete name of the following compound by an accepted method.



3. Draw the structure of the following:
 - i) Oxazolo [3,2-a]azepine
 - ii) Benzothieno[2,3-d]Imidazo[1,2-a]pyrimidine
4. Why α -N-acetylaminoketone is one of the most reliable intermediate for preparation of oxazolo and thiazole moiety?
5. Suggest probable mechanism for the following transformation:

$$\text{2,4,6 trimethyl pyrrilium salt} \xrightarrow{\text{H}_2\text{O}_2} \text{2-acetyl-3,5-dimethylfuran}$$
6. Write the mechanism for the conversion of 4-pyrone into 1-phenyl-4-pyridone by reaction with aniline.
7. Suggest probable mechanism for the following transformation:

$$\text{Quinoline} \longrightarrow \text{4-amino-3,6-dinitroquinoline}$$
8. Give the synthesis of 7-methoxy 2-methyl quinoxaline.
9. Give the mechanism for the formation of 4-methyl-3,6-diphenyl pyridazine from 3,6-diphenyl-1,2,4,5-tetrazine using prop-1-ene-1-ol in presence of THF.

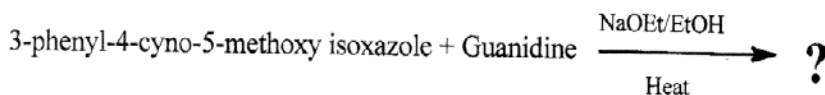
Q.3 A. Answer the following.

- i) Give the bischler and reissert synthesis for Indole preparation. [03]
 - ii) Suggest the reasonable mechanism for the transformation of 1,2,3,4-tetrahydrocarbazole from cyclohexanone. [03]
- B. Discuss briefly about benzo[b]thiophenes. [06]

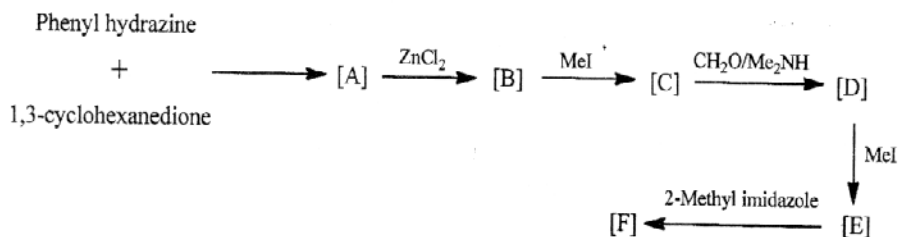
OR

B. Answer the following.

- i) Give the mechanistic interpretation describing the product from the following: [03]



- ii) Complete the following reaction scheme: [03]



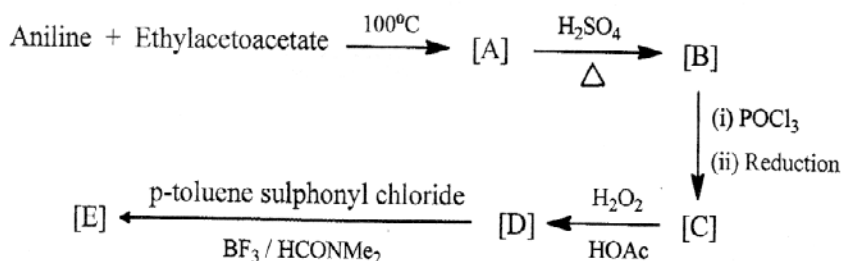
Q.4 A. Give the synthesis of quinolines and isoquinolines. Explain electrophilic and nucleophilic reaction of quinolines and isoquinolines. [06]

B. Answer the following.

- i) Write a note on 1,3,5,8-tetrazo naphthalene. [03]
- ii) Give the synthesis of cinnoline and quiazoline starting from methyl anthranilate and anthranilic acid respectively. [03]

OR

B. Complete the following reaction scheme [A to E], suggest the mechanism for last step [D to E]. [06]

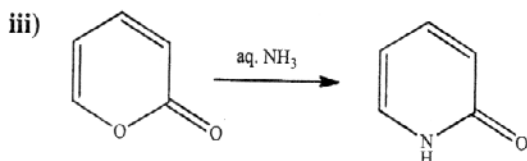
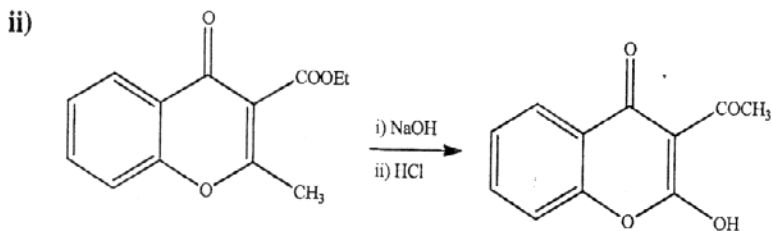
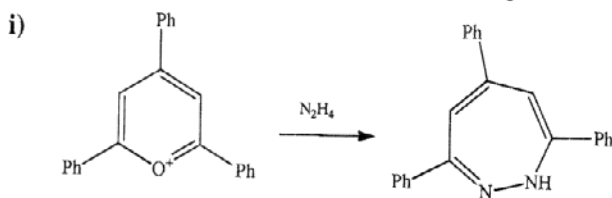


- Q.5** A. Discuss briefly about electrophilic substitution reaction of substituted pyridine. [06]
 B. Give at least two synthetic method for the synthesis of each 1,2-diazines, [06]
 1,3-diazines and 1,4-diazines.

OR

- B. Answer the following.
 i) Give the synthesis of 1,2,3,4-tetrazine. Justify that "cycloaddition of tetrazine and alkyne gives pyridazine with elimination of nitrogen" by citing suitable example. [03]
 ii) Explain the reaction of s-triazine with N_2H_4 , NH_2OH and $R-NH_2$. [03]

- Q.6** A. Suggest the mechanism for the following transformations: [06]



- B. Write at least one synthesis of each α -pyrone and γ -pyrone. Discuss their reaction with $PhNHNH_2$, $NaCN$ and CH_3MgCl . [06]

OR

- B. Describe the synthesis of pyrylium salt and discuss its reaction with NH_2NH_2 , [06]
 $Ph-CH_2MgBr$, wittig reagent and H_2O_2 .

