

SARDAR PATEL UNIVERSITY

M.Sc. Semester-III (Organic Chemistry) Examination

Monday, 25th March 2019

Heterocyclic Chemistry: PS03CORC03

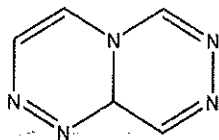
Time: 02:00 pm to 05:00 pm

Marks: [70]

Note: Right hand figures indicate marks

Q-1: Select the correct answer from the option given below. [08]

1. Which is the correct name of following heterocyclic compound?



- a) 9aH-[1,2,4] triazino [5,4-c][1,2,4] triazine
 b) 9aH-[1,3,5] triazino [1,2-d][1,2,4] triazine
 c) 6aH-[1,2,4] triazino [5,4-c][1,2,4] triazine
 d) None of these
2. Indole reacts with conc.HNO₃/conc.H₂SO₄ at 0 °C gives _____.
 a) 3-nitro indole b) 4-nitro indole c) 5-nitro indole d) 6-nitro indole
3. 2-methyl quinazoline on reaction with SeO₂ gives _____.
 a) 2-formyl quinazoline b) quinazoline-2-carboxylic acid
 c) 1,2-dihydroquinazoline d) None
4. Isoquinoline on reaction with Br₂/CCl₄ gives ____ isoquinoline.
 a) 3-bromo b) 4-bromo c) 5-bromo d) 8-bromo
5. The most basic diazine is _____.
 a) Pyridazine b) Pyrazine c) Pyrimidine d) 2-nitro pyrazine
6. Reactions of pyridine with KOH /300° gives _____.
 a) 3-hydroxy pyridine b) 2-pyridone c) 3-pyridone d) 5-hydroxy pyridine
7. Reaction of α-pyrone using NO₂⁺BF₄⁻ gives _____.
 a) 4-nitro deri. b) 5-nitro deri. c) 6-nitro deri. d) None
8. 4-methyl pyrylium salt on reaction with aq. NH₃ /RT gives _____.
 a) 4-methyl pyridine b) 4-methyl benzene c) 2-amino-4-methyl pyridine d) None

Q-2: Answer the following questions. (Any Seven) [14]

1. Draw the correct possible structure of the following.
 i) Isothiazolo[5,4-d]oxazole
 ii) Pyrano[2,3-c]pyrrole
2. Boiling point of imidazole (256 °C) and pyrazole (187 °C) is much higher than anticipated, Justify the statement.
3. Explain Knorr synthesis of 4-methyl quinoline.
4. Why sulphonation of pyridine take place at higher temperature but that of 2,6-ditertiary butyl pyridine occurs under mild condition?
5. Explain Pechmann condensation.

6. Give the synthesis of 5-nitrophthalazine from 3-nitrophthalic acid.
7. Write the synthesis of Flavone.
8. Explain the Chichibabin reaction of pyridine.
9. Write the ISAY synthesis. [06]

Q-3 [A] Answer the following questions.

1) Explain Bischler indole synthesis.

2) Write the synthesis of Tryptamine. [06]

[B] Explain the reactivity of 1,2-azole and 1,3-azole. Also write two reactions of each. [06]

OR

[B] Answer the following questions.

1) Discuss the reactions of benzo[b]furan with reducing agent, photodimerization and cycloaddition reaction.

2) Describe the electrophilic substitution reactions of benzo[b]thiophene. [06]

Q-4 [A] Discuss electrophilic and nucleophilic substitution reactions of quinoline and isoquinoline. [06]

[B] Answer the following questions.

1) Explain the Bischler-Napieralski synthesis of isoquinoline.

2) Give two general methods for synthesis of each cinnoline and quinazoline [06]

OR

[B] Discuss the cyanine dye of quinoline. [06]

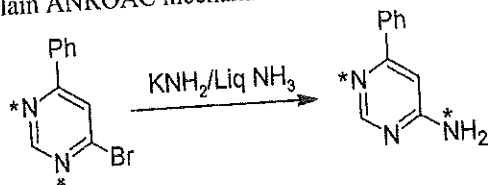
Q-5 [A] Give at least two syntheses for each pyridazine, pyrimidine and pyrazine. [06]

[B] Describe the electrophilic substitution reactions of substituted pyridine. [06]

OR

[B] Answer the following.

1) Explain ANROAC mechanism for following transformation. [06]



2) Discuss the cycloaddition reaction of 1,2,4,5-tetrazine with alkyne. [06]

Q-6 [A] Give at least one synthesis of coumarins and chromones and also describe their electrophilic substitution reactions. [06]

[B] Describe the synthesis of pyrylium salt. Explain its reaction with H_2O_2 , N_2H_4 and $PhCH_2MgCl$. [06]

OR

[B] Write at least one synthesis of α -pyrone and γ -pyrone. Discuss their reactions with $NaOH$, $NaCN$, NH_3 & $PhNHNH_2$. [06]

~~***~~