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SEAT No._____ No. of Printed Pages : 3

# SARDAR PATEL UNIVERSITY

[164/A31] **M.Sc. Semester-III (Organic Chemistry) Examination**

**Saturday, 27th October 2018**

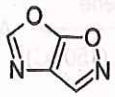
**Heterocyclic chemistry: PS03CORC03**

**Time: 02:00 pm to 05:00 pm** **Marks: [70]**

Note: Right hand figures indicate marks

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

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



(a) [1,3]Oxazolo[4,5-d][1,2]oxazole (b) [1,2]Oxazolo[4,5-d][1,3]oxazole
(c) [1,3]Oxazolo[2,3-b][1,2]oxazole (d) [1,2]Oxazolo[2,3-b][1,3]oxazole

2. Benzene ring fused with pyrrole is called_____.
(a) benzo[b]furan (b) quinoline (c) indole (d) benzo[b]thiophene

3. Which of the following reaction is not used for synthesis of quinoline?
(a) Skraup synthesis (b) Combe synthesis
(c) Knorr synthesis (d) Pomeranz- Fritsch synthesis

4. Reaction of uracil with 1,2-dimethylhydrazine yields _____.
(a) 1,2-dimethylpyrazol-5-one & dimethyl urea (b) pyrazole & urea
(c) 1,2-dimethylpyrazol-5-one & urea (d) pyrazole & dimethyl urea

5. Bromination of isoquinoline in presence of $CCl_4$ followed by treatment with pyridine gives _____ derivative.
(a) 5-bromo (b) 6-bromo (c) 4-bromo (d) 1-bromo

6. Which of the following is the correct basicity order?
(a) pyrimidine>pyrazine>pyridine (b) pyrazine>pyridine>pyrimidine
(c) pyridine>pyrazine>pyrimidine (d) pyridine>pyrimidine>pyrazine

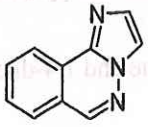
7. Coumarin in the presence of excess $AlCl_3$, bromination reaction proceeds at_____.
(a) 6th position (b) 5th position (c) 4th position (d) 3rd position

8. Reaction of 2-benzopyrylium salt with $NH_3$ yields _____.
(a) quinoline (b) isoquinoline (c) indole (d) pyridine

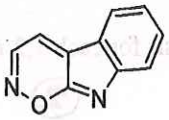
**Q-2 Answer the following (Any Seven).** **[14]**

1. Give the complete name of the following compounds.

A.



B.





(PTO)

2. Write Pfitizinger synthesis of quinoline.

3. Write ISAY synthesis.

4. Imidazole is stronger base that pyrrole, explain.

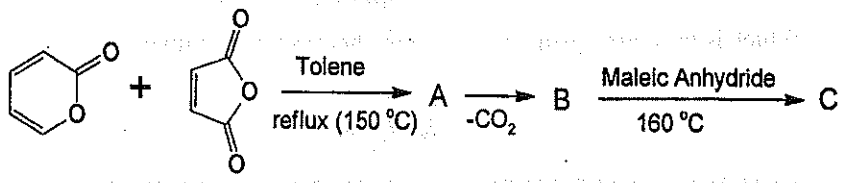
5. Write the synthesis of 1-benzopyrylium salt from salicyaldehyde.

6. Suggest the mechanism for following transformation.

$$\text{3-Bromo isoquinoline} \xrightarrow[\text{-33 °C}]{NaNH_2/\text{Liq. } NH_3} \text{3-amino isoquinoline}$$

7. Pyridine is weaker base than ammonia, explain.

8. Complete the following reaction scheme.

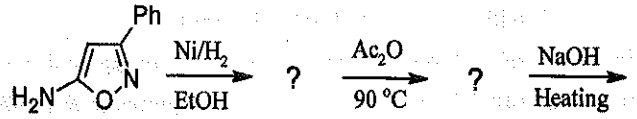



9. Give the mechanism for transformation of 2-methyl-3-hydroxy pyridine from 2-acetyl furan.

**Q-3 [A]** Discuss Fischer indole synthesis and Reissert synthesis. **[06]**

**[B]** Answer the following. **[06]**

1. Write the ring expansion reactions of indole.
2. Complete the following reaction scheme.




**OR**

**[B]** Write synthesis and electrophilic substitution reaction of Benzo[b]thiophenes. **[06]**

**Q-4 [A]** Answer the followings. **[06]**

1. Explain the formation of isomeric quinolines by Conrad Limpach and Knorr method.
2. Give one synthesis of quinoxaline and phthalazine.

**[B]** Answer the followings. **[06]**

1. Describe briefly electrophilic substitution reactions of substituted quinoline.
2. How one can convert quinoline to quinoline-2-carboxylic acid? Give the mechanism for formation of quinoline-2-carboxylic acid.

**OR**

**[B]** Write a note on cyanine dyes of Benzo[b]pyridine. **[06]**

**Q-5 [A]** Describe the electrophilic substitution reactions of substituted pyridine-N-oxide. **[06]**

**[B]** Give at least two synthesis for each 1,2-diazine, 1,3-diazine and 1,4-diazine. **[06]**

**OR**

**[B]** Answer the following. **[06]**

1. Describe ring transformation reactions of pyrimidine.
2. Give the synthesis of s-triazine and explain its reaction with phenyl hydrazine.

**Q-6 [A]** Write at least one synthesis of α-pyrone and γ-pyrone. Describe their electrophilic substitution reactions. **[06]**

**[B]** Answer the following. **[06]**

1. Give the synthesis of coumarin derivative and flavone starting from resorcinol and *o*-phenyl acetate respectively.
2. Write reactions of coumarin, chromone and flavone with NaOH respectively.

**OR**

**[B]** Describe the synthesis of pyrylium salt. Explain reactions of 2,4,6-trimethylpyrilium salt with $H_2O_2$, NaOH and NaCN. **[06]**

—X—