SEAT No._____ 5C

No. of printed pages: 03

[79 & A-48]

SARDAR PATEL UNIVERSITY

M.Sc. (Organic Chemistry), Semester – III

April 13, 2018 :: Friday

Time: 02:00 P.M. – 5:00 P.M.

HETEROCYCLIC CHEMISTRY [PS03CORC03]

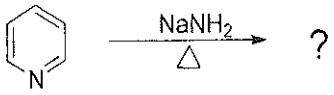
Note: Figures to the right indicate full marks. **Total marks: 70**

Q-1 **Select the correct answer and mention only the code of correct answer against their question numbers.** [08]

a. Indoles cannot be prepared by
(i) Madelung synthesis
(ii) Reissert method
(iii) Hantzsch synthesis
(iv) Nenizescu synthesis

b. Which one of the following is not a pyrimidine base?
(i) Uracil
(ii) Adenine
(iii) Thymine
(iv) Cytosine

c. Identify the correct product in the following transformation.

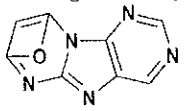


(i) 1-Amino pyridine
(ii) 3-Amino pyridine
(iii) 2-Amino pyridine
(iv) 5-Amino pyridine

d. Which one of the following substrates is used as one of the starting material in Pfitzinger synthesis of quinoline?
(i) Aniline
(ii) Crotonaldehyde
(iii) β-phenyl ethylamine
(iv) Isatin

e. Quinoxaline is.....
(i) 1,2-Benzodiazine
(ii) 1,3-Benzodiazine
(iii) 1,4-Benzodiazine
(iv) 2,3-Benzodiazine

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



(i) 2,4-epoxypyrimido[5,6-a]purine
(ii) 2,4-epoxypyrazino[5,6-a]purine
(iii) 7,9-epoxypyridazo[1,2-e]purine
(iv) 7,9-epoxypyrimido[1,2-e]purine

g. Reaction of α-pyrone with aq. NH_3 under heating condition yields_____
(i) 2-pyridone (ii) 3-pyridone (iii) 4-pyridone (iv) pyridine

h. When Salicyldehyde react with Ac_2O in presence of NaOAc gives_____
(i) coumarin (ii) indole (iii) phenol (iv) quinoline

(P.T.O.)

Q-2 **Answer ANY SEVEN of the following in short.** **[14]**

a. Write the Skraup synthesis of Quinoline

b. Draw the structure of the following.
(i) 2*H*-[1,4]dithiepino[2,3-c]furan (ii) 1*H*-pyrazolo[4,3-d]oxazole

c. Discuss the basicity order of 1,2-diazine, 1,3-diazine and 1,4-diazine.

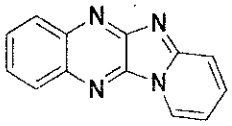
d. Write the mechanism for the conversation of 4-pyrone into 1-phenyl-4-pyridone by reaction with aniline.

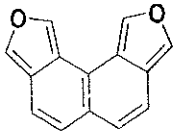
e. Give the synthesis of 1,2-diazine.

f. Explain: 2-Hydroxy pyridine is predominantly exist in keto form rather than enol form.

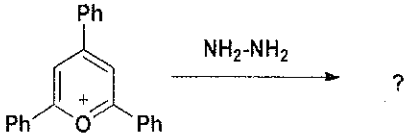
g. Write ISAY synthesis.

h. Give the name of the following compound by an accepted method.

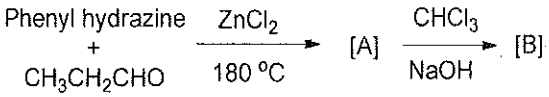
i) 

ii) 

i. Suggest the product with detail mechanism.



Q-3 [A] Identify the structure of **A** and **B**. Suggest the mechanism for each of the following transformation. **[06]**



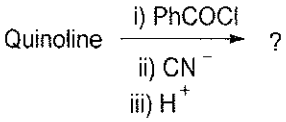
Q-3 [B] Write the synthesis of (i) Tryptamine and (ii) Ondensetron **[06]**

OR

Q-3 [B] Write the synthesis and electrophilic substitution reactions of Benzo[b]thiophenes. **[06]**

Q-4 [A] **Suggest the product with proper mechanistic pathway.** **[06]**

i.



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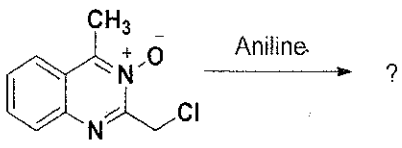


Q-4 [B] **Answer the following.** **[06]**

i. Give the synthesis of cinnoline and quinazoline starting from methyl anthranilate and anthranilic acid respectively.

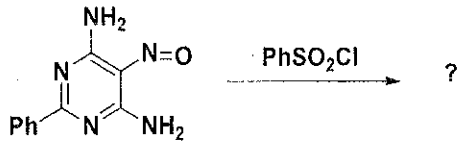
ii. Give the Bischler-Napieralski synthesis of isoquinoline.

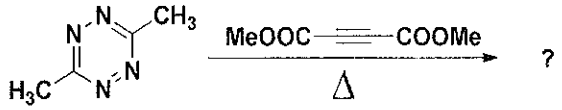
OR

Q-4 [B] Explain cyanine dyes of Benzo[b]pyridine. **[06]**

Q-5 [A] Give the synthesis of *s*-triazine. Explain the reaction of *s*-triazine with R-NH_2, Ph-NH-NH_2, NH_2NH_2 and NH_2OH. [06]

Q-5 [B] Complete the following reaction scheme and give their mechanism [06]

(i) 

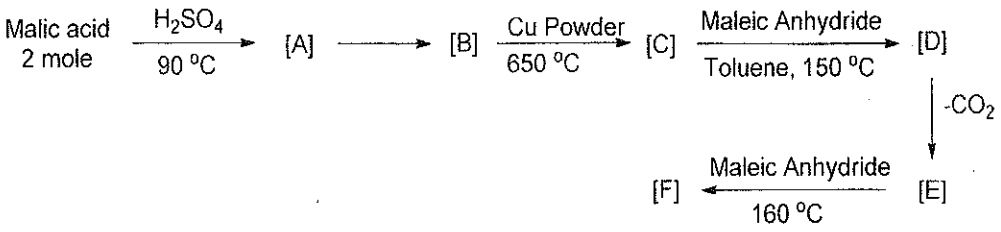
(ii) 

OR

Q-5 [B] Describe briefly about electrophilic substitution reactions of substituted pyridine. [06]

Q-6 [A] Describe one synthesis of each α-pyrone and γ-pyrone. Explain their reaction with $PhNHNH_2$, NaCN and CH_3MgCl [06]

Q-6 [B] **Complete the following reaction scheme.** [06]



OR

Q-6 [B] Write the synthesis of coumarin and chromone, give their reaction with electrophilic reagents. [06]

—X—