NCE-003-1112003 Seat No. _____

M. Sc. (Sem. II) (CBCS) Examination

April / May - 2017

Industrial Chemistry : IC-203

(Heterocyclic Chemistry)

Faculty Code : 003

Subject Code : 1112003

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All question are compulsory.
(2) Each question carries 14 marks.

1 Answer any Seven out of the following ten questions : **14**

(1) Write the Fisher synthesis of Indole.

(2) Explain two synthesis of Pyridazine

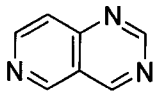
(3) Discuss electrophilic substitution reaction of Isoxazole.

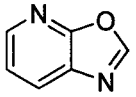
(4) Explain synthesis of the 1,3,4-Oxadiazole.

(5) Write the reduction reaction of Quinoline.

(6) Write two synthesis of Pyrazine.

(7) Give nomenclature of the following

(i) 

(ii) 

(8) Give the structures of the following

(i) Furo [3,2-b] furan.

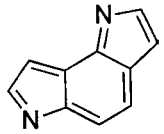
(ii) Pyridazino [4,5-b] quinoxaline.

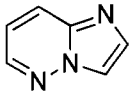
(9) Draw the structures of the following heterocycles.

(i) Quinoline (ii) Phthalazine

(iii) Quinazoline (iv) Quinoxaline

(10) Give the nomenclature of the following

(i) 

(ii) 

2 Answer any Two out of the following three questions : 14

(1) Give three synthesis and electrophilic substitution reactions of Pyridine.

(2) Explain Skraup and Friedlander synthesis of Quinoline and its application.

(3) Describe the electrophilic substitution reactions of Pyrimidines and Quinazolines.

3 Answer the following Two questions : 14

(1) Discuss electrophilic and nucleophilic substitution reactions and application of Indole.

(2) Give structures of the following :

(i) Thieno[2,3-*b*]furan

(ii) Thiazolo[5,4-*b*]thiazole

(iii) Benzo(*b*)furan

(iv) Pyrido[3,4-*b*]pyrazine

(v) Furo[2,3-*c*]quinoline

(vi) Imidazolo[5,4-*b*]pyridine

(vii) 1H-pyrazolo[3,4-*d*]pyrimidine

OR

3 Answer the following **two** questions : 14

(1) Write at least three syntheses and electrophilic substitution reactions of Benzofuran.

(2) Give synthesis and electrophilic reaction of 1,2,4-Triazole.

4 Answer any two out of the following three questions : 14

(1) Discuss synthesis and electrophilic substitution reactions of Oxazole.

(2) Explain nucleophilic substitution reactions and synthesis of Pyrazole.

(3) Give synthesis and electrophilic substitution reactions of Benzothiophene.

5 Answer any **two** out of the following four questions : **14**

(1) Discuss electrophilic substitution reactions of Isothiazole and Thiazole.

(2) Explain the electrophilic and nucleophilic substitution reactions of Quinoxaline.

(3) Write synthesis, electrophilic and nucleophilic substitution reactions of Phthalazine.

(4) Explain :

(i) Knorr synthesis of Quinoline,

(ii) Biginelli reaction of Pyrimidine
