'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2023

CC9-CHEMISTRY

ORGANIC CHEMISTRY

Time Allotted: 2 Hours | Full Marks: 40

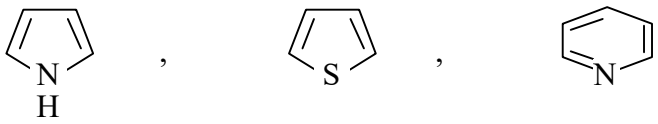
The figures in the margin indicate full marks.

1. Answer any ***five*** questions: 1×5 = 5

(a) What is π-excessive aromatic heterocycle?

(b) In Fischer indole synthesis which of the two nitrogen atoms of phenyl hydrazine is incorporated in the indole?

(c) Arrange the decreasing order of reactivities of following compounds towards electrophile



(d) Write down the structures of Hygrine and Nicotine.

(e) How can you distinguish between methyl amine and aniline?

(f) Mention the medicinal importances of cocaine and reserpine.

(g) How many isoprene units are present in sesquiterpene?

2. Answer any ***three*** questions: 5×3 = 15

(a) (i) Sulphonation of naphthalene takes place at 1-position at lower temperature, whereas at a higher temperature, it takes place at 2-position — Explain. 3

(ii) Which of the following hydrocarbons, phenanthrene and anthracene would react more readily with maleic anhydride? 2

(b) (i) Discuss the importance of Emde degradation in alkaloid chemistry. 3

(ii) Explain why hygrine racemises rapidly. 2

(c) (i) How do you establish the position of unsaturation in citral? 3

(ii) 2-picoline is more acidic than toluene — Explain. 2

(d) (i) Why benzene diazonium chloride couples with *N*,*N*-dimethylaniline, but not with *N*,*N*,2,6-tetramethylaniline under similar condition? 3

(ii) How do you prove that nicotine has N-CH_3 group? 2

(e) (i) Write down the mechanism of Hantzsch pyridine synthesis. 3

(ii) Which position is most preferred in electrophilic substitution of pyridine? 2

3. Answer any ***two*** questions: $10\times2 = 20$

(a) (i) Explain Hofmann's exhaustive methylation with an illustration. 3

(ii) Discuss the synthesis of α -Terpineol. 3

(iii) How will you make electron-deficient pyridine nucleus more reactive towards electrophiles? 2

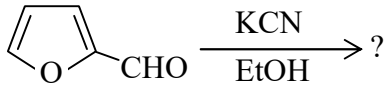
(iv) Convert 2-pyridone to 2-chloropyridine. 2

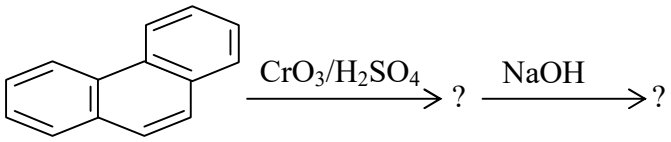
(b) (i) Show the synthetic route of phenanthrene using Bardhan-Sengupta method. 5

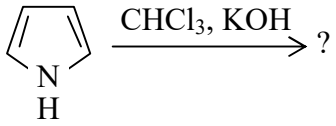
(ii) How can you separate 1°, 2° and 3° amines by Hinsberg method? 3

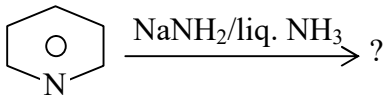
(iii) Naphthalene on complete reduction gives two stereoisomers — Explain. 2

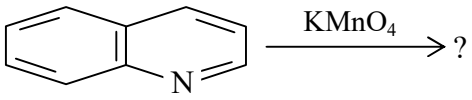
(c) Predict the product(s) with suitable mechanisms (any ***four***): $2\frac{1}{2}\times4 = 10$

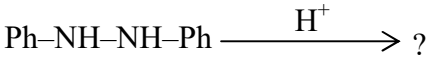
(i) 

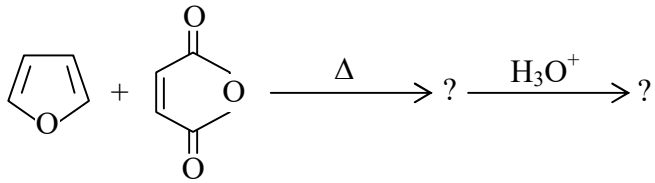
(ii) 

(iii) 

(iv) 

(v) 

(vi) 

(vii) 

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