

B.Sc Chem (Hons) Sem VI
 Paper XIV
 Model Questions

Q1 (a) Give one method of preparation of derivatives of pyrrole, furan and thiophene.

4x3 = 12.

(b) Write the resonating structures of pyrrole, furan and thiophene.

$2\frac{1}{2} + 2\frac{1}{2} + 4 = 9$

(c) Give the order of their aromaticity with reason.

4

Q2 (a) Discuss with mechanism

(a) Bischler-Napieralski synthesis of isoquinoline

10

(b) Conrad-Limpach and Kuosv synthesis of quinoline

15

Q3 (a) Give two methods of preparation of indole derivatives.

12

(b) Give the product of oxidation and reduction of indole

8

(c) Give the tautomeric structure of indole.

5

Q.4 (a) Discuss Skraup synthesis of quinoline with mechanism-
12.

(b) How sulphonation, nitration and bromination of quinoline is effected?
9

(c) What happens when quinoline is treated with (i) NaNH_2 and (ii) $n\text{-BuLi}$?
2+2

Q.5 (a) Why 2-attack is preferred in pyrrole as compared to 3-attack with electrophilic reagents? 5

(b) Why furan is more active than pyrrole in the above mentioned reactions? 5

(c) Give the products when pyrrole is treated with

(i) solid KOH , (ii) CH_3MgBr (iii)

HNO_2 in acetic anhydride at low temp,

(iv) pyridine-SO_2 in ethylene dichloride (v) CrO_3 in acetic acid

2x5 = 10

(d) Give the ring opening of pyrrole with Hoffmann degradation
tion- 5

Q11. How pyrrole is isolated from
 (a) bone oil? 4.

(b) How thiophene is isolated from coal tar? 6

Q12. What happens when

(i) Furan is treated with a pine
 splint moistened with HCl acid?

(ii) Vapours of pyrrole is treated with
 a pine splint moistened with HCl acid?

(iii) When thiophene is treated with
 lead in and H_2SO_4 acid?

(iv) How pyrrole and furan reacts with
 (i) maleic anhydride (ii) $C_6H_5N_2CHCOOH$.
 What inference can be drawn?

~~200 = 3~~ $1 \times 3 = 3$
 $3 + 3 + 1 = 7$

Q6. Describe any two of the followings with mechanism -

- (i) Free radical polymerization
- (ii) Cationic polymerization
- (iii) Anionic polymerization

5 × 2 = 10

Q7. Write short notes on any two of the followings

- (i) Phenol formaldehyde resins
- (ii) Urea formaldehyde resins
- (iii) Polyamides

5 × 2 = 10

Q8. Give the synthesis of methyl orange and phenolphthalein.

5 × 2 = 10

Q9. (a) Explain the action of heat on α , β and γ -amino acids.

10

(b) Give two methods of synthesis of glycine

$\frac{7 \frac{1}{2}}{2} \times 2 = 15$

Q10. (a) How pyrrole is isolated from bone oil?

(b) How thiophene is isolated from coal-tar?

4
6

Q.11. (a) What happens when

(i) Furan is treated with a pine splint moistened with HCl acid?

(ii) Vapours of pyrrole are brought in contact with a pine splint moistened with HCl acid?

(iii) Thiophene is treated with isatin and H_2SO_4 acid?

$$1 \times 3 = 3$$

(b) How furan and pyrrole react with (i) maleic anhydride and (ii) $N_2CHCOOH$? What inference can be drawn from these?

$$3 + 3 + 1 = 7$$