

10.06.15 (ASTU-4th Sem. Reg)

Total No. of printed pages = 6

PY 132409

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B.Pharm 4th Semester, End-Term Examination

PHARMACEUTICAL CHEMISTRY-IV

(Organic Chemistry – III)

Full Marks – 100 Pass Marks – 35 Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Answer any six questions : 2×6=12
- (a) What is heterocyclic compound ? Classify them. Give example in each class.
- (b) What are amino acids ? How they are related to proteins ?
- (c) Why furan is weakly basic in nature ?
- (d) What are the agents that cause denaturation of protein ?

[Turn over

(e) What happens when pyrrole is treated with
(i) Cold solution of nitric acid and acetic anhydride

(ii) Aqueous solution of potassium carbonate at 100°C ?

(f) What is mutarotation ?

(g) What happens when glycine undergoes acylation ?

(h) Draw the structure of any two amino acids containing aliphatic side chains.

2. Answer any *six* questions : $3 \times 6 = 18$

(a) Write any three methods of preparation of furan.

(b) What are fibrous and globular proteins ? Explain with suitable examples.

(c) Describe the electrophilic substitution reaction mechanism of Pyrrole. Write any three important chemical reactions of Pyrrole.

(d) Write synthesis of amino acid by the following methods :

(i) Strecker synthesis

(ii) Gabriel-Phthalimide synthesis.

71/PY 132409

(2)

(e) (i) What happens when ortho-toluidine is treated with formic acid ?

(ii) What happens when indole undergoes Reimer-Tiemann formylation ?

(iii) What happens when pyridine undergoes reduction in presence of Ni at 200°C ?

(f) What is Ruff degradation ? Distinguish between reducing sugar and non-reducing sugar.

(g) Explain the mechanism of Zwitter ion.

(h) Write short notes on isolation of protein.

3. Answer any *eight* questions : $5 \times 8 = 40$

(a) Classify carbohydrates according to the number of simple sugar units. Describe the chemistry of glucose. How will you convert an aldose to an isomeric ketose ?

(b) What is Reformatsky reaction ? Explain its mechanism.

71/PY 132409

(3)

[Turn over

- (c) (i) What happens when fructose is treated with excess phenyl hydrazine ?
- (ii) Describe the Haworth representation of glucose and fructose.
- (iii) What is Killiani Fisher synthesis ?
- (d) What are proteins ? Classify proteins with suitable examples. Write a note on colour tests of protein.
- (e) (i) Write the physico-chemical properties of oils and fats.
- (ii) What is saponification number ?
- (iii) What is Fisher indole synthesis ?
- (f) (i) What are the methods of preparation of Quinolene (any two) ? Describe its physical and chemical properties.
- (ii) Discuss the chemistry of sucrose.
- (iii) Draw the structure of D-ribose and D-arabinose.

71/PY 132409

(4)

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- (g) (i) Starting from glucose, how will you prepare Sorbitol, n-hexane and glucosazone.
- (ii) How thiophene is synthesized ? Describe its important chemical reactions.
- (h) What are essential and non-essential amino acids ? Write the importance of essential amino acid.
- (i) What is Benzoin condensation ? Write down its reaction mechanism.
- (j) Discuss the chemical properties of amino acids due to carboxyl group and amino group.

4. Answer any *three* questions : $10 \times 3 = 30$

- (a) (i) How pyrrole is synthesized (any two) ? What happens when pyrrole is treated with the following reagents :
- Benzene diazonium chloride in weakly basic solution.
 - Sulphur trioxide in pyridine
 - Bromine in alcohol.
- (ii) Write any two methods of preparation of pyridine. Describe the electrophilic substitution reaction mechanism of pyridine. Write any two important chemical reaction of pyridine. $5+5=10$

71/PY 132409

(5)

[Turn over

(b) (i) Discuss the chemistry of lactose and starch.

(ii) Write down the method of preparation of pyrimidine and imidazole. What happens when succinic dialdehyde undergoes dehydration by heating with P_2O_5 or $ZnCl_2$? How will you distinguish monosaccharide and disaccharide? $4+6=10$

(c) (i) Describe the electrophilic substitution reaction mechanism of Indole with examples.

(ii) Discuss any two methods of preparation of Isoquinoline.

(iii) Discuss the physical and chemical properties of Pyridine. $4+3+3=10$

(d) Write down the following reaction with reaction mechanism and their application.

(i) Diels-Alder Reaction.

(ii) Claisen Condensation. $5+5=10$

(e) What is peptide linkage? Explain the structure and synthesis of peptides. $2+8=10$