

## CHMDC 114(T+P): Biomolecules

**Credit – (2T+2P), Theory Hours – 30, Practical Hours – 60**

### Course outcomes:

CO – 1. Gain knowledge of protein and polypeptide, their classification, structure, importance as bio molecules and their role in biochemical processes and different types of titrations.

CO – 2. Describe the introduction of soaps and detergents, their manufacturing and applications in day to day life and apply the knowledge in various industries as well as inter disciplines.

CO-3. Solve the problems regarding the synthesis and structures of protein and polypeptides and lipids and titrations.

### CO-PSO mapping (connecting COs with PSOs)

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	3	2	3	2	2
CO-2	3	3	2	2	2	3
CO-3	2	3	3	2	3	2

### UNIT – I - Protein and polypeptide

**[25 Marks]  
[15 Hours]**

Introduction to protein and polypeptide, Geometry of peptide bond, synthesis of amide bond, 1<sup>0</sup>, 2<sup>0</sup> and 3<sup>0</sup> structure of protein, Methods for C and N terminal residues.

### UNIT – II - Lipids

**[25 Marks]  
[15 Hours]**

Occurrence and composition of fat, Hydrolysis of fat, soap miceller, fats as pure sources of acids and alcohols, detergents, unsaturated fats, hardening of oil, drying oils.

## **Reference books**

1. 'Organic Chemistry' Morrison, R.T. and Boyd, R.N. 6<sup>th</sup> Ed. 1992, Prentice Hall International, Inc., London.
2. Handbook of Industrial Chemistry: Organic Chemicals, 1st Edition · Mohammad Farhat Ali, · Bassam M. El Ali, James G. Speight, 2005, McGraw-Hill Education
3. Perfumes Soaps Detergents & Cosmetics Volume 1, 1<sup>st</sup> addition, (Soaps & Detergents, S. C.Bhatia, 2009, Dattani book agency

## **CHMDC 114 (P): Chemistry Practical**

### **Chemistry Lab- I**

**Credit – 2, Hours – 60, Marks - 50**

Safety Practices in the chemistry laboratory, identification of different apparatus, knowledge about toxic chemicals and safety precautions in their handling, how to proper uses of different glass wares.

### **(I) Titrimetric analysis**

(a). Calibration of glassware and use of apparatus to be discussed

1. Calibration of 10 ml pipette
2. Calibration of 25 ml burette
3. Calibration of 100 ml measuring flask

(b). Preparation of solutions of different Normality, Molarity and % V/V, % W/V, % W/W to be discussed

### **(II) Acid base titrations**

(a). Principle of Acid base titration to be discussed

(b). Preparation of standard solutions of 0.1N Succinic acid, 0.1N Hydrous & Anhydrous Oxalic acid, 0.1N NaOH.

1. Std. Succinic acid (0.1N)  $\rightarrow$  NaOH/ KOH
2. Std. hydrous & anhydrous Oxalic acid (0.1N)  $\rightarrow$  NaOH/ KOH
3. Std. NaOH (using Succinic acid) (0.1N)  $\rightarrow$  HCl

### **(III) REDOX TITRATION**

(a). Preparation of standard solutions of (0.05N)  $\text{KMnO}_4$  & (0.01N)  $\text{K}_2\text{Cr}_2\text{O}_7$

1. Std.  $\text{KMnO}_4$  (0.05N)  $\rightarrow$   $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  /  $\text{FeSO}_4(\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$
2. Std.  $\text{K}_2\text{Cr}_2\text{O}_7$  (0.05N)  $\rightarrow$   $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  /  $\text{FeSO}_4(\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$

### **(IV) Complexometry Titration**

a). Preparation of standard solutions of (0.01M) EDTA

1.  $\text{Ca}^{++}$  /  $\text{Mg}^{++}$   $\rightarrow$  Std. EDTA (0.01M)

### **(V) Viva-Voce questions**

## **REFERENCE BOOKS**

1. 'Vogel's Textbook of Quantitative Chemical analysis' Revised by G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney, ELBS (English Language Book Society) Longman. 5<sup>th</sup> Ed., New York.
2. 'Analytical Chemistry' by Dhruva Charan Dash, 2011, 2<sup>th</sup> Ed., PHI Learning Private Ltd, New Delhi.
3. 'Analytical Chemistry' by Gary D. Christian, 1986, 4<sup>th</sup> Ed., John Wiley & Sons.

4. 'Advanced Practical Inorganic Chemistry' by Gurdeep Raj, 9<sup>th</sup> Ed., Goel Publishing House, Meerut.

5. 'Advanced University Practical Chemistry' by P. C. Kamboj, Vishal Publishing Co., Jalandhar – Delhi.