GUJARAT TECHNOLOGICAL UNIVERSITY

B.Pharm

SEMESTER: IV

Subject Name: Pharmaceutical Chemistry – V (Biochemistry – II) Subject Code: 2240003

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Theory		Practical	
				External	Internal	External	Internal
3	0	3	6	80	20	80	20

Theory

Sr.	Course contents			
No.		Hours		
1	Detailed chemistry of Proteins and nucleic acid	08		
2.	Metabolism of ammonia and nitrogen containing monomers: nitrogen balance, biosynthesis of amino acids, catabolism of amino acids, conversion of amino acids to specialized products. Assimilation of ammonia, urea cycle. Metabolic disorders of urea cycle, metabolism of sulphur containing amino acids, porphyrin biosynthesis, formation of bile pigments, hyperbilirubinemia, purine biosynthesis, purine nucleotide interconversion, pyridine biosynthesis.	12		
3.	Biosynthesis of nucleic acids. Brief introduction of genetic organization of the mammalian genome, alteration and rearrangement of genetic material, biosynthesis of DNA and its replication, DNA repair mechanism, biosynthesis of RNA	05		
4.	Genetic code and protein synthesis: genetic code, components of protein synthesis and inhibition of protein synthesis. Brief account of genetic engineering and polymerase chain reactions	05		
5.	Regulation of gene expression	02		
6.	The Concept of free energy, Determination of Change in free energy from Equilibrium Constant and Reduction Potential, Bioenergetics, Production of ATP and its Biological Significance	02		
7.	Biological oxidation, enzymes and co-enzymes involved in oxidation reduction and its control. The respiratory chain, its role in energy capture and its control, energetic of oxidative phosphorylation, inhibitors of respiratory chain and oxidative phosphorylation, mechanism of oxidative phosphorylation	08		
8.	Techniques used in biochemistry: spectrophotometry, centrifugation, electrophoresis, chromatography, extraction and purification of proteins and nucleic acids	03		

Identification of various proteins (Gelatine, Casein, Albumin etc....) 1 Identification of various proteins (Peptone, Creatinine etc....) 2 3 To identify substances of physiological importance (Protein, Lactic Acid, HCl etc...). To identify substances of physiological importance (Bile, Blood, Creatinine, Urea, 4 Acetone, NaCl etc....) To perform the tests for normal inorganic and organic constituent of urine. 5 To perform the qualitative analysis for pathological (abnormal) constituents in urine. 6 To estimate Creatinine in blood by colorimetric analysis. 7 To estimate total proteins in plasma by biuret method. 8 9 To perform the estimation of urea in blood by diacetyl method. 10 To perform estimation of chloride and phosphate in urine. 11 To determine titratable acidity and ammonia in urine. 12 To perform the estimation of Calcium and Magnesium in urine. To perform biochemical analysis of bile. 13 14 Separation of Amino Acids (Proline, Glutamate, Aspartate, Glycine, Alanine etc...) by Paper Chromatography. Separation of Amino Acids (Proline, Glutamate, Aspartate, Glycine, Alanine etc...) 15 Thin Layer Chromatography (TLC). 16 To estimate calcium in serum. 17 Colourimetirc analysis of Bilirubin and cholesterol in plasma. Estimation of uric acid in urine. 18

PRACTICAL - 22400P3

Books recommended:

- 1. E. E. Conn and P. K. Stumpf, Outlines of biochemistry, John Wiley and Sons, New York.
- 2. A. L. Lehninger, Principles of biochemistry, CBS publishers and distributors.
- 3. R. K. Murray, D. K. Granner, P. A. Mayes. V.W. Rodwell, Harpers biochemistry, Prentice hall international Inc. latest edn.
- 4. M.Cohn, K.S. Roth, Biochemistry and disease. William and Wilkins co. Baltimore, Latest edn.
- 5. U.Satyanarayan, Biochemistry, Books and allied (P) ltd. Calcutta, latest edn.
- 6. G. F. Zubay, W. W. Parson, D. E. Vance, Principles of Biochemistry, WCB publishers, England, latest edn.
- 7. S.K. Sawhney, Randir Singh Eds, Introductory practical biochemistry, Narosa publishing house New Delhi.
- 8. D. T. Plummer, An introduction to practical biochemistry, Tata McGraw Hill New Delhi.
- 9. J. Jayaraman, Laboratory manual in biochemistry, Wiley eastern Ltd. New Delhi.
- 10. G. T. Mills, G. Leaf Practical Biochemistry, John Smith and Son Ltd.
- 11. Alan H. Gowenlock, Janet R. Mcmurray, Donald M. McLauchlan, Varley's Practical clinical biochemistry, Heinemann professional publishing.
- 12. P. G. Tikekar, Practical Biochemistry.