

CORE COURSE III

PHYSIOLOGY AND BIOCHEMISTRY

THEORY

(CREDITS 4)

Unit 1

1.1 Digestion

Physiology of digestion; Absorption of carbohydrates, proteins and lipids

1.2 Respiration

Pulmonary respiration, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood, types of respiratory pigments, oxygen dissociation curves

1.3 Excretion

Formation and excretion of nitrogenous wastes

1.4 Origin and conduction of cardiac impulse

Unit 2

2.1 Different types of potentials, action potential and its propagation in different nerve Fibres

2.2 Molecular and chemical basis of muscle contraction

2.3 Physiology of vision

2.4 Physiology of hearing

Unit 3 Endocrinology

3.1 Hormonal control of gametogenesis

3.2 Hormonal control of reproductive cycles in mammals

3.3 Hormones of pituitary, thyroid and Parathyroid

3.4 Hormones of Pancreas, Adrenal and Thymus

Unit 4

4.1 Carbohydrate metabolism

Glycolysis, Krebs Cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, Electron transport chain;

4.2 Lipid metabolism

Biosynthesis and β oxidation of palmitic acid

4.3 Protein metabolism

Transamination, deamination and urea cycle

4.4 Enzymes

Introduction, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation

PHYSIOLOGY AND BIOCHEMISTRY

PRACTICAL

(CREDITS 2)

1. Preparation of hemin and hemochromogen crystals
2. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland
3. Study of permanent slides of spinal cord, duodenum, liver, lung, kidney, bone, cartilage
4. Qualitative tests for carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose)
1. Estimation of total protein in given solutions by Lowry's method.
6. Study of activity of salivary amylase under optimum conditions
7. RBC and WBC counting
8. Estimation of haemoglobin

SUGGESTED READINGS

- Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
- Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
- Guyton, A.C. and Hall, J.E. (2011). *Textbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
- Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.