

A. General Physiology

- * Cell and Organelles
- * Body Fluid compartments
- * Transport across cell membrane
- * Membrane potentials

B. Systemic Physiology

1. Blood :

- * Blood Cells (Red, white and Platelets) : Development & Functions
- * Hemoglobin, Patho-physiology of Anaemia
- * Physiological basis of Immune mechanisms
- * Blood groups systems (ABO, Rh, MNP etc), Physiological basis of Blood Transfusion reactions, Rh incompatibility and Hemolytic Disease of Newborn.
- * Haemostasis: Role of Platelets, Blood Coagulation, Fibrinolysis, Anticoagulants

2. Cardio-Vascular System :

- * Properties of cardiac muscle
- * Origin and conduction of cardiac impulse
- * Cardiac cycle and associated pressure, volume and other changes
- * Physiological basis of Electro-cardiography, Heart sounds
- * Heart rate, Cardiac output regulation
- * Cardio-vascular reflexes
- * Blood Pressure determinants and regulation
- * Regional Circulation : Coronary, cerebral, Pulmonary, Renal, Cutaneous, capillary, Skeletal muscle etc.

3. Respiration :

- * Mechanics : Muscles of breathing, Rib motion, Intra pulmonary & Intrapleural pressure, Lung Compliance & Surfactant, Work of breathing
- * Lung Volumes, Capacities and Lung function tests
- * Oxygen and Carbon dioxide transport between lungs and tissues
- * Regulation of Respiration
- * High altitude physiology, Hypoxia, Asphyxia, Cyanosis, Decompression sickness, Periodic breathing
- * Exercise physiology

4. Digestion :

- * Digestive juices : Composition, functions and regulation of Saliva, Gastric juice, Bile, Pancreatic juice and Secretions of small and large intestine
- * Movements : Mastication, Deglutition, Mixing and Propulsive (Peristalsis) movements of gut
- * Absorption of digested food material
- * Gastro Intestinal Hormones

5. Endocrinology :

- * Mechanism of hormone secretion, Actions, Control of secretion and Disorders of Anterior & Posterior Pituitary, Thyroid, Parathyroid, Adrenal (cortex & medulla) and Pancreas
- * Local Hormones

6. Reproduction :

- * Puberty
- * Male Reproductive System : Structure and functions of male reproductive organs, Spermatogenesis, Endocrine function of testis
- * Female Reproductive System :
- * Structure & functions of ovary, Ovulation, Hormones of ovary
- * Pregnancy : Maternal changes and nutrition during pregnancy, Placental functions and hormones
- * Lactation : Hormones acting on mammary gland, Milk secretion and ejection, Advantage of breast feeding.
- * Family Planning : Physiological basis of different methods

7. Muscle Physiology :

- * Types and Properties of muscles
- * Mechanism of muscle contraction
- * Energetics of muscle contraction

8. Nervous System :

- * Neurons
- * Nerve fibers : Types and Properties, Origin and Conduction of nerve impulse
- * Transmission across Synapse and Neuromuscular junction
- * Pathways & characteristics of a) cutaneous, Deep and Visocral sensations and b) Cortico-spinal & Cortico-bulbar pathways
- * Muscle tone, Maintenance of Posture and Equilibrium
- * Structure, connections, functions and disorders of cerebellum, Thalamus, Hypothalamus, Limbic system, Basal ganglia and Cerebral cortex
- * E.E.G., Sleep and Arousal mechanisms
- * Speech and its disorders
- * Conditioned reflexes, Learning and Memory
- * Autonomic nervous system: divisions (Sympathic & Parasympathic), their origin functions, neurotransmitters and related drug actions.

9. Special Senses :

- * Vision : Image formation, Refractive media and Refractive errors, Photoreceptors and Photochemistry, Colour Vision, Visual Pathways and their lesions
- * Hearing : Structure and functions of external, middle and internal ear, Organ of Corti, Mechanism and pathways of hearing, Deafness
- * Smell and taste : Receptors, mechanism and pathways

10. Excretion :

- * Structure and functions of kidney Nephron
- * Urine formation: Glomerular filtration and tubular function
- * Role of kidney in regulation of water balance, sodium, potassium and chloride excretion; acid-base balance, etc.
- * Renal function tests
- * Micturition : Filling and emptying of urinary bladder, Micturition reflexes and disorders

11. Functions of Skin and regulation of Body Temperature