Smt. Chandaben Mohanbhai Patel Homeopathic Medical College
Department of Physiology including Biochemistry
(Applicable from Batch 2022-2023 onwards for 5 years or until further notification by National Commission for Homoeopathy whichever is earlier)

ATP FOR THEORY

Total hours as per NCH – 325 hours

Paper-I		
Sr. No	**List of System**	**Teaching Hours**
1	General Physiology	20
2	Bio Physics Science	15
3	Skin & The Integumentary System	15
4	Body fluids & Immune mechanism	35
5	Nerve Muscle physiology	15
6	Cardiovascular system	20
7	Respiratory and Environmental Physiology	25
8	Renal Physiology	20
	Total	**165**

Paper-II		
Sr. No	**List of System**	**Teaching Hours**
1	Central Nervous System	35
2	Endocrinology	30
3	Reproduction	15
4	Special Senses	20
5	Digestion and Nutrition	35
6	Biochemistry	25
	Total	**160**

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Sr. no.	Topic	No of Lectures in Hr.
1	**General Physiology**	**20**
	Define Physiology; Discuss importance of learning physiology in homeopathic course	1
	Discuss the internal and external environment of the body	1
	Explain regulation of internal environment	1
	Explain Homeostasis and its control	3
	Describe structure of cell	1
	Describe function of cell	1
	List organelles present in cell with their functions	2
	List of intracellular junction with its importance	2
	Explain Passive transport	3
	Explain Active transport	3
	Explain Vesicular transport	2
2	**Bio Physics Science**	**15**
	Filtration and Ultra-filtration	1
	Intracellular communication	1
	Adsorption and Absorption	1
	Hydrotrophy, Dialysis and Assimilation	1
	Surface tension	1
	Action potential, Nerve action potential, Transmembrane potential	2
	Donnan's Equilibrium	1
	Tracer Elements	1
	Rhythmicity of some excitable tissues	1
	Ionic Bond, Covalent Bond, Hydrogen Bond	1
	Colloid, Solution, Suspension	1
	Characteristics of Acid, Base and Salt	1
	Acid Base balance and its application to concept of pH	1
	Describe the maintaining of pH: Buffer system	1
3	**Skin & The Integumentary System**	**15**
	Discuss layers of skin with their functions	3
	Relate the structure of hair with its function	3
	Relate the structure of nail with its function	3
	Relate the structure and describe different glands of skin with its function	3
	Explain regulation of body temperature	3
4	**Body fluids & Immune mechanism**	**35**
	Discuss composition and function of blood; Define serum, difference between serum and plasma	1

	Explain origin, forms and functions of plasma proteins; relation to diet	1
	Structure, synthesis, normal function, values of different varieties of Hb	2
	Iron metabolism, normal structure of RBC with morphology	2
	Stages of erythropoiesis, fate of RBC, discuss haemolysis	2
	Classify and discuss anaemia acc. to their morphology and aetiology	2
	Enumerate different abnormal functions in anaemia	2
	Fate of bilirubin; physiological jaundice and jaundice in new born	2
	Classify types of WBC, functions of WBC as per classification	2
	Stages of leucopoiesis and its regulation; discuss phagocytosis	2
	Explain different conditions of abnormal leucocyte count in our body	2
	Thrombopoiesis; structure & function of platelets; Count and variation	2
	Coagulation, Haemostasis, stages of clotting	2
	Discuss haemorrhagic disorders	2
	ABO blood group, Rh blood group, Landsteiner's law, Rh incompatibility	2
	Importance and causes of blood transfusion	2
	Tissue Macrophage system, morphology and function of lymphocytes and plasma cell	2
	Functions of spleen, formation and function of lymph	1
	Immunity and its types; development of immune response	1
	Autoimmunity, Hypersensitivity, Immunodeficiency diseases	1
5	**Nerve Muscle physiology**	**15**
	Define and classify neurons; Explain structure and function of neuroglia; Define and explain process of Excitability and Conductivity	1
	Discuss graded action potential	1
	Discuss causes and grade of injury; Identify stages of degeneration; Discuss stages of regeneration	1
	Structure of Neuro-Muscular Junction	1
	Discuss Neuro-Muscular Transmission	1
	Discuss disorders of Neuro-Muscular junction	1
	Describe general mechanism of muscle contraction and mechanism of skeletal muscle contraction	1
	Discuss molecular mechanism	1
	Discuss Energetic of Muscle contraction	1
	Discuss excitation of skeletal muscle	1
	Explain Contraction of Smooth muscle	1

	Explain nervous and hormonal control of Smooth muscle contraction	1
	Functional anatomy of cardiac muscle	1
	Explain properties of cardiac muscle	1
	Discuss disorders of skeletal muscles	1
6	**Cardiovascular system**	**20**
	Chamber, Valves, Walls, Pacemaker, Conducting system of heart; functions of heart and circulation	1
	Morphological, Electrical, Mechanical, and Metabolic properties of heart	1
	Cardiac cycle and its events, ECG and pressure changes during each C.C.	2
	Heart sounds and their measurement techniques; Murmurs and Triple heart sounds	2
	ECG – waves and intervals; Unipolar and bipolar recording	2
	Arrhythmia; degrees of Heart block; Myocardial infarction	2
	Structure of blood vessels, Pressure changes in vascular system	1
	Factors affecting and control of heart rate	2
	Cardiac output – distribution, factors affecting, control mechanisms	2
	Blood pressure – importance, factors affecting, determinants, regulation	2
	Mechanism of hypertension	1
	Capillary circulation, Coronary circulation, Cerebral circulation, Splenic circulation, Pulmonary circulation	1
	Mechanism responsible for shock and syncope	1
7	**Respiratory and Environmental Physiology**	**25**
	Upper respiratory tract, Lower respiratory tract, Tracheo-bronchial tree, Respiratory membrane, Pleura, Properties of gases	2
	Non respiratory function of RS, Mechanism of inspiration and expiration, intra-pulmonary pressure, intra-pleural pressure	2
	Static and dynamic lung volumes and capacities	3
	Surface tension; lung surfactant; O2-CO2 transportation	3
	Nervous and chemical regulation of respiration	3
	Apnoea, Dyspnoea, Asphyxia, Cyanosis, Oxygen toxicity	3
	Hypoxia and its classification	2
	Principals and methods of artificial respiration	3
	Pressure changes during high altitude and effect during rapid and slow ascent on high altitude	2
	Pressure changes during deep sea diving	2

8	**Renal Physiology**	**20**
	Structure and function of kidney and nephron, Organization and function of glomerulus, Nerve supply of urinary bladder	2
	Classify nephron; structure and function of JG apparatus	2
	Process of Glomerular filtration, regulation, mechanism and factors affecting of Glomerular filtration rate	3
	General consideration of reabsorption and secretion; Transport mechanism through tubular segments, transport of individual substances in different segments of renal tubule	3
	General consideration of urine concentration mechanism, counter current exchangers, counter current multipliers	3
	Renal regulation of acid base	2
	Buffer system in kidney	2
	Micturition reflex	3
9	**Central Nervous System**	**35**
	Parts of CNS – brain and spinal cord with its function, classify nervous system	1
	Developmental aspect of CNS	1
	Synapse – physiological anatomy, electrical events, and properties	2
	Receptors; classify sensory receptor; cutaneous receptors and its properties	2
	Reflexes - classification with its properties; reflex arc	2
	Neurotransmitters – types and classification	2
	Sensory system and sensory tracts of spinal cord	2
	Somato-sensory cortex and somatic sensation (touch, pressure, pain, temperature, proprioception)	2
	Motor areas and motor tracts of spinal cord	2
	Vestibular apparatus – physiological anatomy, functions, and common vestibular dysfunctions	2
	Difference between somatic and autonomic nervous system; divisions of autonomic nervous system; response of effector organ to autonomic nerve impulse	2
	Functions of spinal cord; transection of spinal cord; sensory disturbances of spinal cord	2
	Connections and functions of cerebral cortex	1
	Connections and functions of basal ganglia	1
	Connections and functions of thalamus	1
	Connections and functions of hypothalamus	1
	Connections and functions of limbic system	1
	Connections and functions of cerebellum	1
	Cerebellar lesions; importance and physiological basis of EEG	2

	Sleep – physiological changes, factors affecting, types, factors controlling	2
	Mechanism and development of speech	1
	Physiological basis of learning	1
	Physiological basis and applied physiology of memory	1
10	**Endocrinology**	**30**
	Hormones – characteristics and classify as per chemistry	1
	Regulation and homeostatic mechanism of secretion of hormones	1
	Physiological anatomy, secretions of anterior pituitary, Pituitary insufficiency	1
	Secretion, function, factors affecting, and effects of altered secretion of GH	1
	Action and control of secretion of prolactin	1
	Secretion of posterior pituitary hormones	1
	Functions of ADH and Oxytocin	1
	Physiological anatomy of thyroid hormone, formation, secretion, transport, regulation, action, metabolism, effects of altered secretion of thyroid hormone	2
	Calcium and phosphate metabolism, Action of Calcitonin, role of calcitonin in maintenance of calcium homeostasis	2
	Action of Parathormone, effects of altered secretion of Parathormone	2
	Adrenal cortex and Adrenal Medulla – Physiological Anatomy	2
	Glucocorticoid – Formation, Secretion, Function	2
	Mineralocorticoids – Formation, Secretion, Function	2
	Sex hormones – Formation, Secretion, Function	2
	Effects of altered secretion of adrenal cortex hormones	2
	Physiological anatomy of Pancreas; action and regulation of Insulin and Glucagon	2
	Effects of altered secretion of Pancreatic hormone	2
	Functions of hormones of Thymus and Pineal gland	2
	Physiology of Local Hormones; Diagnosis of pregnancy through urine pregnancy strip	1
11	**Reproduction**	**15**
	Puberty, Role of LH and FSH in development of puberty	1
	Puberty for its onset and stages; causes for delay and precocious puberty	1
	Structure and function of male reproductive system	1
	Functions of testis and role of testosterone	1
	Spermatogenesis – Process and factors affecting	1
	Structure and function of female reproductive system	1

	Role of ovary and hormones secreted by it	1
	Ovarian changes during menstrual cycle	1
	Uterine changes during menstrual cycle	1
	Vaginal changes and Gonadotropin changes during menstrual cycle	1
	Changes during menopause	1
	Contraceptives methods for male and female	1
	Fertilization, implantation, role of placenta, placental hormones	2
	Process of parturition, Process of lactation, Role of prolactin	1
12	**Special Senses**	**20**
	Physiology of olfaction, Sensation of olfaction, olfactory receptors, olfactory pathway, altered sensation of smell	3
	Physiology of taste, Sensation of taste, taste receptors, taste pathway, altered sensation of taste	3
	Physiological anatomy of ear, Auditory pathway, Mechanism of hearing, altered sensation of hearing	3
	Structure and function of eye, visual pathway, principal of optics	3
	Photochemistry of vision, Photopic and scotopic vision	3
	Visual acuity, Visual reflex, Visual adaptation, Visual accommodation	3
	Refractive errors, Night blindness, Colour blindness, Nystagmus	2
13	**Digestion and Nutrition**	**35**
	Importance and structure of digestive system; structure of large and small intestine	1
	Classify salivary gland, Composition and function of saliva	1
	Innervation, Mechanism and Control of salivary secretion, Clinical relevance of salivary secretions and salivary gland	2
	Process of mastication, stages of swallowing, role of upper and lower oesophageal sphincter, common oesophageal motility disorders	1
	Macro and micro structure of stomach, functions of stomach, Composition and function of gastric juices	2
	Mechanism and regulation of gastric juice, Process of digestion in stomach	2
	Movements of stomach, Phases of vomiting	1
	Composition, function, mechanism and regulation of pancreatic juice	2
	Exocrine pancreatic insufficiency	2
	Structure, function and signs of insufficiency of liver	2
	Structure, function of gall bladder, Control and mechanism of bile secretion	2

	Composition and function of liver bile and gall bladder bile	1
	Clinical significance of liver functions and gall bladder functions	1
	Macro and micro structure of small intestine, composition and function of Succus Entericus	2
	Process of digestion in small intestine, Peristalsis and segmentation movements of small intestine	2
	Clinical importance of small intestine, Malabsorption syndrome	2
	Movements, absorption and secretion in large intestine	2
	Clinical significance of large intestine, Process of defecation	2
	Digestion and absorption of carbohydrate	1
	Digestion and absorption of fats	1
	Digestion and absorption of proteins	1
	Absorption of water and electrolytes	1
	Absorption of vitamins and minerals	1
14	**Biochemistry**	**25**
	Biosynthetic and catabolic pathways	2
	Importance, different properties of lipids	2
	Types, functions and food sources of carbohydrates	2

	Process of glycolysis; Process of ATP production through oxidative phosphorylation	3
	Process of gluconeogenesis	2
	Functions and oxidation of amino acids	2
	Special features of protein metabolism; synthesis of proteins	3
	Functions of nitrogenous part; exogenous and endogenous protein metabolism	2
	Concept, importance and function of enzymes; concept of chemical reaction, catalyst, substrate	3
	Classify vitamins and their common deficiencies	4
Total lectures		**325**

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ATP FOR PRACTICALS
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HAEMATOLOGY			
Sr. No.	**Practical**	**Demonstration / Performance**	**Number of teaching Hours**
1	Study of the Compound Microscope	Performance	05
2.	Collection of Blood Samples	Performance	05
3	Estimation of Haemoglobin Concentration	Performance	05
4	Determination of Haematocrit	Demonstration	05
5	Haemocytometer	Performance	05
6	Total RBC Count	Performance	10
7	Determination of RBC Indices	Demonstration	05
8	Total Leucocytes Count (TLC)	Performance	10
9	Preparation And Examination Of Blood Smear	Performance	10
10	Differential Leucocyte Count (DLC)	Performance	10
11	Absolute Eosinophil Count	Demonstration	05
12	Determination of Erythrocyte Sedimentation Rate	Demonstration	05
13	Determination of Blood Groups	Performance	05
14	Determination of Bleeding Time and Coagulation Time	Performance	05

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BIOCHEMISTRY			
Sr. No.	**Practical**	**Demonstration / Performance**	**Number of Teaching Hours**
1	Demonstration of Uses Of Instruments Or Equipment	Demonstration	05
2	Qualitative Analysis of Carbohydrates, Proteins And Lipids	Performance	10
3	Normal Characteristics of Urine	Performance	04
4	Abnormal Constituents of Urine	Performance	10
5	Quantitative Estimation of Glucose, Total Proteins, Uric Acid in Blood	Performance	05
6	Liver Function Tests	Demonstration	04
7	Kidney Function Tests	Demonstration	04
8	Lipid Profile	Demonstration	04
9	Interpretation and Discussion of Results of Biochemical Tests	Demonstration	04

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CLINICAL PHYSIOLOGY			
Sr. No.	**Practical**	**Demonstration / Performance**	**Number of Teaching Hours**
1	Case Taking & Approach to pt	Performance	05
2	General Concept Of Examination	Performance	10
3	Examination of muscles, joints,	Performance	10
4	Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination	Performance	15
5	Nervous System- Clinical Examination	Performance	15
6	Respiratory System- Clinical Examination, Spirometry, Stethography	Performance	15
7	Special Senses- Clinical Examination	Performance	15
8	Reproductive System- Diagnosis of Pregnancy	Performance	05
9	Gastrointestinal System- Clinical Examination	Performance	10
OPD – APPLIED PHYSIOLOGY			
1	OPD (Applied Physiology)	Demonstration and Performance	90

PREPARED BY	APPROVED BY
HEAD OF DEPARTMENT	P. F. Damaina PRINCIPAL