



SHREE H.N. SHUKLA

HOMOEOPATHIC

MEDICAL COLLEGE & HOSPITAL



PHYSIOLOGY & BIOCHEMISTRY

Instructions:

I (a) The purpose of a course in physiology is to teach the functions, processes and inter-relationship of the different organs and systems of the normal disturbance in disease and to equip the student with normal standards of reference for use while diagnosing and treating deviations from the normal;

To a Homoeopath the human organism is an integrated whole of body life and mind and though life includes all the chemico-physical processes it transcends them;

There can be no symptoms of disease without vital force animating the human organism and it is primarily the vital force which is deranged in disease;

Physiology shall be taught from the stand point of describing physical processes underlying them in health;

Applied aspect of every system including the organs is to be stressed upon while teaching the subject.

II (a) There should be close co-operation between the various departments while teaching the different systems;

There should be joint courses between the two departments of anatomy and physiology so that there is maximum co-ordination in the teaching of these subjects;

Seminars should be arranged periodically and lecturers of anatomy, physiology and bio-chemistry should bring home the point to the students that the integrated approach is more meaningful.

A. Theory:

The curriculum includes the following, namely:-

I. General physiology:

Introduction to cellular physiology

Cell Junctions

Transport through cell membrane and resting membrane potential

Body fluids compartments

.Homeostasis

II. Body fluids:

Blood

Plasma Proteins

Red Blood Cells

Erythropoiesis

Haemoglobin and Iron Metabolism

Erythrocyte Sedimentation Rate

Packed Cell Volume and Blood Indices

Anaemia

Haemolysis and Fragility of Red Blood Cells

White Blood Cell

Immunity

Platelets

Haemostasis

Coagulation of Blood

Blood groups

Blood Transfusion

Blood volume

Reticulo-endothelial System and Tissue Macrophage

Lymphatic System and Lymph

Tissue Fluid and Oedema

III. Cardio-vascular system:

Introduction to cardiovascular system

Properties of cardiac muscle

Cardiac cycle

General principles of circulation

Heart sounds

Regulation of cardiovascular system

Normal and abnormal Electrocardiogram (ECG)

Cardiac output

Heart rate

Arterial blood pressure

Radial Pulse

Regional circulation- Cerebral, Splanchnic, Capillary, Cutaneous & skeletal muscle circulation

Cardiovascular adjustments during exercise

IV. Respiratory system and environmental physiology:

Physiological anatomy of respiratory tract

Mechanism of respiration : Ventilation, diffusion of gases

Transport of respiratory gases

Regulation of respiration

Pulmonary function tests

High altitude and space physiology

Deep sea physiology

Artificial respiration

Effects of exercise on respiration

V. Digestive system:

Introduction to digestive system

Composition and functions of digestive juices

Physiological anatomy of Stomach, Pancreas, Liver and Gall bladder, Small intestine, Large intestine

Movements of gastrointestinal tract

Gastrointestinal hormones

Digestion and absorption of carbohydrates, proteins and lipids

VI. Renal physiology and skin:

Physiological anatomy of kidneys and urinary tract

Renal circulation

Urine formation : Renal clearance, glomerular filtration, tubular reabsorption, selective secretion, concentration of urine, acidification of urine

Renal function tests

Micturition

Skin

Sweat

Body temperature and its regulation

VII. Endocrinology:

Introduction to endocrinology

Hormones and hypothalamo-hypophyseal axis

Pituitary gland

Thyroid gland

Parathyroid

Endocrine functions of pancreas

Adrenal cortex

Adrenal medulla

Endocrine functions of other organs

VIII. Reproductive system:

Male reproductive system- testis and its hormones; seminal vesicles, prostate gland, semen.

Introduction to female reproductive system

Menstrual cycle

Ovulation

Menopause

Infertility

Pregnancy and parturition

Placenta

Pregnancy tests

Mammary glands and lactation

Fertility

Foetal circulation

IX. Central nervous system:

Introduction to nervous system

Neuron

Neuroglia

Receptors

Synapse

Neurotransmitters

Reflex

Spinal cord

Somato-sensory system and somato-motor system

Physiology of pain

Brainstem, Vestibular apparatus

Cerebral cortex

Thalamus

Hypothalamus

Internal capsule

Basal ganglia

Limbic system

Cerebellum - Posture and equilibrium

Reticular formation

Proprioceptors

Higher intellectual function

Electroencephalogram (EEG)

Physiology of sleep

Cerebro-spinal fluid (CSF)

Autonomic Nervous System (ANS)

X. Special senses:

Eye : Photochemistry of vision, Visual pathway, Pupillary reflexes, Colour vision, Errors of refraction

Ear: Auditory pathway, Mechanism of hearing, Auditory defects

Sensation of taste : Taste receptors, Taste pathways

Sensation of smell : Olfactory receptors, olfactory pathways

Sensation of touch

XI. Nerve muscle physiology:

Physiological properties of nerve fibres

Nerve fibre- types, classification, function, Degeneration and regeneration of peripheral nerves

Neuro-Muscular junction

Physiology of Skeletal muscle

Physiology of Cardiac muscle
Physiology of Smooth muscle
EMG and disorders of skeletal muscles

XII. Bio-physical sciences:

Filtration
Ultra filtration
Osmosis
Diffusion
Adsorption
Hydrotropy
Colloid
Donnan Equilibrium
Tracer elements
Dialysis
Absorption
Assimilation
Surface tension

B. Practical:

Haematology:

Study of the Compound Microscope
Introduction to haematology
Collection of Blood samples.
Estimation of Haemoglobin Concentration
Determination of Haematocrit
Haemocytometry
Total RBC count
Determination of RBC indices
Total Leucocytes Count (TLC)
Preparation and examination of Blood Smear
Differential Leucocyte Count (DLC)
Absolute Eosinophil Count
Determination of Erythrocyte Sedimentation Rate
Determination of Blood Groups
Osmotic fragility of Red cells
Determination of Bleeding Time and Coagulation Time
Platelet Count
Reticulocyte Count

Human experiments:

General Examination
Respiratory System- Clinical examination, Spirometry, Stethography
Gastrointestinal System- Clinical examination
Cardiovascular System- Blood pressure recording, Radial pulse, ECG, Clinical examination
Nerve and Muscle Physiology- Mosso's Ergography, Handgrip Dynamometer
Nervous System- Clinical examination
Special Senses- Clinical examination
Reproductive System- Diagnosis of pregnancy

BIO-CHEMISTRY

Theory:

Carbohydrates: (Chemistry, Metabolism, Glycolysis, TCA, HMP, Glycogen synthesis and degradation, Blood glucose regulation)

Lipids: (Chemistry, Metabolism, Intestinal uptake, Fat transport, Utilisation of stored fat, Activation of fatty acids, Beta oxidation and synthesis of fatty acids)

Proteins: (Chemistry, Metabolism, Digestion of protein, Transamination, Deamination, Fate of Ammonia, Urea cycle, End products of each amino acid

and their entry into TCA cycle

Enzymes: (Definition, Classification, Biological Importance, Diagnostic use, Inhibition)

5. Vitamins: (Daily requirements, Dietary source, Disorders and physiological role)

**Minerals (Daily requirement, Dietary Sources, Disorders and physiological role)
Organ function tests**

B. Practical:

1. Demonstration of uses of instruments or equipment

Qualitative analysis of carbohydrates, proteins and lipids

Normal characteristics of urine

Abnormal constituents of urine

5. Quantitative estimation of glucose, total proteins, uric acid in blood

Liver function tests

Kidney function tests

Lipid profile

9. Interpretation and discussion of results of biochemical tests.

Examination:

Theory:

No. of Papers- 02

Marks: Paper I- 100

Paper II- 100

1.1. Contents:

1.1.1. Paper-I:

General Physiology, Biophysics, Body fluids, Cardiovascular system, Reticuloendothelial system, Respiratory system, Excretory system, Regulation of body temperature, Skin, Nerve Muscle physiology

1.1.2. Paper-II:

Endocrine system, Central Nervous System, Digestive system and metabolism, Reproductive system, Sense organs, Biochemistry, Nutrition.

Practical Including viva voce

or oral: 2.1. Marks;

200

2.2. Distribution of marks;

Marks

2.2.1. Experiments

50

2.2.2. Spotting

30

**2.2.3. Maintenance of Practical
record/Journal**

20

10

2.2.4. Viva Voce (Oral)

0

Total

200