

PHYSIOLOGY

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;
- (b) 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;

(c) 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;

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

(e) 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;

(b) 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;

(c) 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:

1. Introduction to cellular physiology
2. Cell Junctions
3. Transport through cell membrane and resting membrane potential
4. Body fluids compartments
5. Homeostasis

II. Body fluids:

1. Blood
2. Plasma Proteins
3. Red Blood Cells
4. Erythropoiesis
5. Haemoglobin and Iron Metabolism
6. Erythrocyte Sedimentation Rate
7. Packed Cell Volume and Blood Indices
8. Anaemia
9. Haemolysis and Fragility of Red Blood Cells
10. White Blood Cell
11. Immunity
12. Platelets
13. Haemostasis
14. Coagulation of Blood
15. Blood groups
16. Blood Transfusion
17. Blood volume
18. Reticulo-endothelial System and Tissue Macrophage
19. Lymphatic System and Lymph
20. Tissue Fluid and Oedema

III. Cardio-vascular system:

1. Introduction to cardiovascular system
2. Properties of cardiac muscle
3. Cardiac cycle

4. General principles of circulation
5. Heart sounds
6. Regulation of cardiovascular system
7. Normal and abnormal Electrocardiogram (ECG)
8. Cardiac output
9. Heart rate
10. Arterial blood pressure
11. Radial Pulse
12. Regional circulation- Cerebral, Splanchnic, Capillary, Cutaneous & skeletal muscle circulation
13. Cardiovascular adjustments during exercise

IV. Respiratory system and environmental physiology:

1. Physiological anatomy of respiratory tract
2. Mechanism of respiration : Ventilation, diffusion of gases
3. Transport of respiratory gases
4. Regulation of respiration
5. Pulmonary function tests
6. High altitude and space physiology
7. Deep sea physiology
8. Artificial respiration
9. Effects of exercise on respiration

V. Digestive system:

1. Introduction to digestive system
2. Composition and functions of digestive juices
3. Physiological anatomy of Stomach, Pancreas, Liver and Gall bladder, Small intestine, Large intestine
4. Movements of gastrointestinal tract
5. Gastrointestinal hormones
6. Digestion and absorption of carbohydrates, proteins and lipids

VI. Renal physiology and skin:

1. Physiological anatomy of kidneys and urinary tract
2. Renal circulation
3. Urine formation : Renal clearance, glomerular filtration, tubular reabsorption, selective secretion, concentration of urine, acidification of urine
4. Renal function tests
5. Micturition
6. Skin
7. Sweat
8. Body temperature and its regulation

VII. Endocrinology:

1. Introduction to endocrinology
2. Hormones and hypothalamo-hypophyseal axis
3. Pituitary gland
4. Thyroid gland

5. Parathyroid
6. Endocrine functions of pancreas
7. Adrenal cortex
8. Adrenal medulla
9. Endocrine functions of other organs

II. Reproductive system:

1. Male reproductive system- testis and its hormones; seminal vesicles, prostate gland, semen.
2. Introduction to female reproductive system
3. Menstrual cycle
4. Ovulation
5. Menopause
6. Infertility
7. Pregnancy and parturition
8. Placenta
9. Pregnancy tests
10. Mammary glands and lactation
11. Fertility
12. Foetal circulation

X. Central nervous system:

1. Introduction to nervous system
2. Neuron
3. Neuroglia
4. Receptors
5. Synapse
6. Neurotransmitters
7. Reflex
8. Spinal cord
9. Somato-sensory system and somato-motor system
10. Physiology of pain
11. Brainstem, Vestibular apparatus
12. Cerebral cortex
13. Thalamus
14. Hypothalamus
15. Internal capsule
16. Basal ganglia
17. Limbic system
18. Cerebellum – Posture and equilibrium
19. Reticular formation
20. Proprioceptors
21. Higher intellectual function
22. Electroencephalogram (EEG)

23. Physiology of sleep
24. Cerebro-spinal fluid (CSF)
25. Autonomic Nervous System (ANS)

X. Special senses:

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

1. Ear: Auditory pathway, Mechanism of hearing, Auditory defects
3. Sensation of taste : Taste receptors, Taste pathways
4. Sensation of smell : Olfactory receptors, olfactory pathways
5. Sensation of touch

XI. Nerve muscle physiology:

1. Physiological properties of nerve fibres
2. Nerve fibre- types, classification, function, Degeneration and regeneration of peripheral nerves
3. Neuro-Muscular junction
4. Physiology of Skeletal muscle
5. Physiology of Cardiac muscle
6. Physiology of Smooth muscle
7. EMG and disorders of skeletal muscles

XII. Bio-physical sciences:

1. Filtration
2. Ultra filtration
3. Osmosis
4. Diffusion
5. Adsorption
6. Hydrotropy
7. Colloid
8. Donnan Equilibrium
9. Tracer elements
10. Dialysis
11. Absorption
12. Assimilation
13. Surface tension

B. Practical:

I. Haematology:

1. Study of the Compound Microscope
2. Introduction to haematology
3. Collection of Blood samples.
4. Estimation of Haemoglobin Concentration
5. Determination of Haematocrit
6. Haemocytometry
7. Total RBC count
8. Determination of RBC indices

9. Total Leucocytes Count (TLC)
10. Preparation and examination of Blood Smear
11. Differential Leucocyte Count (DLC)
12. Absolute Eosinophil Count
13. Determination of Erythrocyte Sedimentation Rate
14. Determination of Blood Groups
15. Osmotic fragility of Red cells
16. Determination of Bleeding Time and Coagulation Time
17. Platelet Count
18. Reticulocyte Count

II. Human experiments:

1. General Examination
2. Respiratory System- Clinical examination, Spirometry, Stethography
3. Gastrointestinal System- Clinical examination
4. Cardiovascular System- Blood pressure recording, Radial pulse, ECG, Clinical examination
5. Nerve and Muscle Physiology- Mosso's Ergography, Handgrip Dynamometer
6. Nervous System- Clinical examination
7. Special Senses- Clinical examination
8. Reproductive System- Diagnosis of pregnancy

BIO-CHEMISTRY

A. Theory:

1. Carbohydrates: (Chemistry, Metabolism, Glycolysis, TCA, HMP, Glycogen synthesis and degradation, Blood glucose regulation)
2. Lipids: (Chemistry, Metabolism, Intestinal uptake, Fat transport, Utilisation of stored fat, Activation of fatty acids, Beta oxidation and synthesis of fatty acids)
3. 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)
4. Enzymes: (Definition, Classification, Biological Importance, Diagnostic use, Inhibition)
5. Vitamins: (Daily requirements, Dietary source, Disorders and physiological role)
6. Minerals (Daily requirement, Dietary Sources, Disorders and physiological role)
7. Organ function tests

B. Practical:

1. Demonstration of uses of instruments or equipment
2. Qualitative analysis of carbohydrates, proteins and lipids
3. Normal characteristics of urine
4. Abnormal constituents of urine
5. Quantitative estimation of glucose, total proteins, uric acid in blood
6. Liver function tests
7. Kidney function tests

8. Lipid profile

9. Interpretation and discussion of results of biochemical tests.

C. Examination:

1. Theory:

(1) No. of Papers- 02

(2) Marks: Paper I- 100

(3) 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.

2. Practical Including viva voce or oral:

2.1. Marks; 200

2.2. Distribution of marks;

2.2.1. Experiments

Marks

50

2.2.2. Spotting

30

2.2.3. Maintenance of Practical
record/Journal

20

2.2.4. Viva Voce (Oral)

100

Total

200