



COOCH BEHAR PANCHANAN BARMA UNIVERSITY

PANCHANAN NAGAR, VIVEKANANDA STREET, COOCH BEHAR – 736101

4 Year Under Graduate Degree (Honours) in PHYSIOLOGY

Course: Minor 3

Paper Name: Physiology Minor 3

Paper Code: PHY-MIN3

Theory:

04 Credit

UNIT I: Cellular organization

1. Introduction to organs and systems of human body
2. Cells and Cell Organelles- Types, Histology and Functions of Cell organelles, Cell membrane and Transport across cell membranes.
3. Different tissues Glands
4. Cell Cycle and Cell Division- Basic concept.
5. Body Fluid Components and Homeostasis
6. Osmosis and Diffusion – Definition and Physiological importance.

UNIT II: Circulating body fluids

1. Blood – Components and general function,
2. White blood cells,
3. Platelets and blood clotting,
4. Red blood cells and Haemoglobin,
5. Blood Grouping,
6. Plasma, Lymph and its Function.

UNIT III: Gastro-Intestinal System

1. Anatomy, histology and functions of alimentary canal and digestive glands.
2. Composition and functions of digestive juices including bile.
3. Digestion and absorption of carbohydrate, protein, and lipid.
4. Movements of the stomach and small intestine.

UNIT IV: Nervous system

1. Nerve Cells: Types, Properties and Function, Excitation and Conduction, Different Electrical Events – Depolarization, Repolarization and Hyperpolarization, Glial cells.
2. Muscle cells: Types, Properties and Function, Excitation and contraction of skeletal muscle.
3. Synapse- Functional Anatomy, Mechanism of synaptic transmission. Principal Neurotransmitter Systems



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4. Nervous System: A brief outline of organization and basic functions (sensory, motor and association) of the nervous system, central and peripheral nervous system, Functions of the spinal cord and brain (cerebral cortex and cerebellum), autonomic (sympathetic and parasympathetic) nervous system and its functions.
5. Reflex action - definition, reflex arc, classification, properties
6. CSF: composition, formation, circulation, and functions.

UNIT V: Special senses

1. Vision: anatomy of eye, The Image-Forming Mechanism, Errors in visual process.
2. Hearing: Anatomy of ear, Mechanism of hearing, Loss of hearing.
3. Smell and Taste: Receptors, Physiology of Smell and Taste.

Practical:

02 Credit

1. Histology: Study on compound microscope.
2. Study and Identification of Stained Sections of Different Mammalian Tissues and Organs: Bone, Cartilage, Trachea, Lungs, Spleen, Lymph gland, Esophagus, Stomach, Duodenum, Ileum, Jejunum, large Intestine, Liver, Kidney, Ureter, Salivary glands, Pancreas, Adrenal gland, Thyroid gland, Testes, Ovary, Spinal Cord, Cerebral cortex, Cerebellum, Skin, Cardiac muscle, Skeletal muscle, Smooth muscle, Artery, Vein, Tongue, Uterus.
3. Staining of Squamous epithelium, cornified epithelium tissue
4. Preparation of blood film and identification of blood cells
5. Identification of blood group
6. Determination of visual acuity by Snellen's chart / Landolt's C chart.
7. Determination of colour blindness by Ishihara chart

References:

1. Rastogy, S. C. (2005). Cell and molecular biology. New Age International Publishers.
2. Hardin, J., Becker, G., Kliensmith, L.J. (2012). Becker's World of the Cell, Pearson Education, Inc. U.S.A. 8th edition.
3. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
4. Alberts, B. Johnson, A. Lewis, J. Raff. M. (2008). Molecular Biology of the Cell.
5. Das, D. (2008). Biochemistry. Academic Publishers.
6. Mescher, A.L. (2013). Junqueira's Basic Histology Text and Atlas. Thirteen Edition. The Tata McGraw Hill Companies.
7. Ross, M.H, and Reith, E.J. (2011). Histology - A Text and Atlas. Sixth Edition. The Williams and Wilkins Company.
8. Eroschenko, V.P. (2012). Difiore's Atlas of Histology: With Functional Correlations. Twelfth Edition. Lippincott Williams Wilkins Company.
9. Chatterjee, C.C. (2016). Human Physiology Volume 1. Eleventh Coloured Edition. CBS. Publishers and Distributors Pvt. Ltd.
10. Mahapatra, A.B.S.M. (2014). Essentials of Medical Physiology. Fourth Edition. Current Books International.
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18. Berne, R.M. and Levy M.N. Physiology. C.V. Mosby Co.
19. Guyton, A.C. Hall, J.E. (2007) Text Book of Medical Physiology. Eleventh Edition. W.B. Saunders Co.
20. Core Text Book Of Neuro-Anatomy, by M.B. Carpenter: the Williams and Wilkins Company.
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24. Shepherd. G.M. Neurobiology. Oxford University Press.
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26. Bikramjit Raychaudhury (2020) Comprehensive Model Questions on CBCS Undergraduate Physiology (Volume–I, For Semester I, II & III). Notion Press (Xpress Publishing), ISBN : 9781636063256.
27. Bikramjit Raychaudhury (2020) Comprehensive Model Questions on CBCS Undergraduate Physiology (Volume–II, For Semester IV & V). Notion Press, ISBN : 9781636690971.
28. Babaharik Sharir Bigyan: Jogen Debnath, Shreedhar Prokashani, Kolkata.
29. Mukherjee, K.L. (2004). Medical Laboratory Technology. Vol. I, Vol. II and Vol. III. Tata McGraw-Hill.
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Course: *Minor 4*

Paper Name: Physiology minor 4

Paper Code: PHY-MIN4

Theory:

04 credit

UNIT I: Cardiovascular system

1. Anatomy of heart,
2. Origin and Spread of Cardiac Excitation,
3. Mechanical Events of the Cardiac Cycle,
4. Cardiac Output,
5. Systemic regulation by hormones and nervous system,
6. Effect of exercise on cardiovascular system,
7. Blood pressure and Hypertension (in brief),
8. Heart Failure, stroke (in brief)

UNIT II: Respiratory System

1. Anatomy of the Lungs,
2. Mechanics of breathing – Mechanism, Gas exchange in the lungs,
3. Oxygen Transport – Mechanism, dissociation curve,
4. Carbon Dioxide Transport –Mechanism, dissociation curve,
5. Effects of Exercise on respiration, Hypoxia.

UNIT III: Renal System

1. Anatomy of kidney,
2. Function of Malpighian corpuscles and renal tubule,
3. Mechanism of formation of urine,
4. Filling and emptying of the Bladder,
5. Composition of urine

UNIT IV: Endocrine System

1. Histology and functions of pituitary, thyroid, adrenal gland, pancreas
2. Functions of growth hormone, thyroid hormone, catecholamines, insulin and steroid hormones.
3. Disorder related to hypo and hyper secretion of these hormones.

UNIT V: Reproductive System

1. Anatomy of male and female reproductive system,
2. Histological structure of testis, ovary and uterus,
3. Testicular and ovarian hormones functions
4. Menstrual cycle,
5. Fertilization.



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Practical:

02 Credit

1. Study and Identification of Stained Sections of Different Mammalian Tissues and Organs: Trachea, Lungs, Kidney, Ureter, Pancreas, Adrenal gland, Thyroid gland, Cardiac muscle, Skeletal muscle, Smooth muscle, Artery, Vein, Testes, Ovary, Uterus.
2. Recording of systemic arterial blood pressure, Effect of exercise on blood pressure
3. Measurement of oxygen saturation by pulse oxymeter before and after exercise
4. Measurement of peak expiratory flow rate
5. Pneumographic recording of effects of hyperventilation, breath-holding and talking on respiratory movements.
6. Testing of normal and abnormal constituents of urine (Biochemical Test)

References:

1. Das, D. (2008). Biochemistry. Academic Publishers.
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