

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS OF SCREENING TEST FOR THE POST OF SENIOR DEMONSTRATOR – PHYSIOLOGY MEDICAL EDUCATION DEPARTMENT

Unit-I - General Physiological Principles :

Principles of homeostasis, Structure of Cell, Structure of cell membrane, Intercellular communications Transport across cell membrane, Gibbs-Donnan equilibrium, Nernst equation, Fluid compartments of the body. Basic principles of Genetics and its Applied Aspects and Apoptosis.

Unit-II - Blood :

Composition and functions of blood, types & functions of Plasma proteins, RBC: formation, functions anemias and polycythemias, Hemoglobin- synthesis and functions, Blood Groups : basis of blood grouping, clinical importance, blood banking and transfusion, WBC: formation, functions and Leukemias, Platelets : formation & functions. Haemostasis and its applications inclusive of anticoagulants and Bleeding Disorders, Thymus and Immunity.

Unit-III - Muscle and Nerve Physiology :

Structure functions and properties of Neuron and Neuroglia, Classification, functions and properties of nerve Fibers, Molecular basis of resting membrane and action potential, Transmission of nerve impulse, Nerve Injuries, Structure, types and properties of muscle fibers, Action potential in different muscle types, Excitation-Contraction coupling, Structure and transmission across neuro-muscular junction, Neuro-muscular blocking agents, Pathophysiology of Myasthenia gravis and Eaton-Lambert Syndrome, Muscular changes during exercise.

Unit-IV - Renal System :

Structure and functions of nephron, Structure and function of Juxta glomerular apparatus inclusive of Renin-Angiotensin-Aldosterone system (RAAS), Physiology of urine formation, Transport maximum and renal threshold, GFR and factors affecting GFR, Mechanism of concentration and dilution of urine inclusive of counter current mechanism, Fluid, electrolyte, and Acid base balance and its regulation, Innervations of bladder, micturition, cystometrogram, abnormal bladder. Artificial kidney, dialysis, Renal Function Test.

Unit-V - Digestive System :

General organization of GIT muscles, innervation and nerve plexuses. Functions and composition of Salivary secretion, Gastric secretion, Pancreatic secretion, Intestinal secretion and Bile. Liver – structure and functions, liver function tests. Jaundice – types & laboratory investigations. Gastro-intestinal hormones-source, regulation and functions, Gastro-intestinal movements, G.I.T. reflexes. Vomiting and diarrhea, constipation. Dietary fibres. Digestion and absorption of carbohydrates, proteins, fats, vitamins, minerals and trace elements, Patho-physiology of peptic ulcer.

Unit-VI - Endocrinology :

Types of hormones, mechanism of hormone action, Estimation and assessment of Hormones. Physiological actions and effect of altered secretions of Pituitary gland, Thyroid gland, Parathyroid gland, Adrenal gland, Pancreas, Pineal and hypothalamus.

Unit-VII - Reproductive System :

Sex differentiation & development Functions of testis & ovary, Spermatogenesis & factors influencing it, Menstrual cycle-hormonal, uterine and ovarian changes, Physiological changes during pregnancy, parturition and lactation, Physiological basis for pubertal changes and menopause, Physiological effect of sex hormones, Physiology of Contraception and Contraceptive methods (male and female methods).

Unit-VIII - Cardiovascular System :

Structure and properties of cardiac muscle, Conducting system of heart, Regulation of heart rate and blood pressure and cardiac output, Electrocardiogram-physiological basis and applications, Abnormal ECG, Heartblocks and Patho-Physiology of Heart-faliure. Haemodynamics of circulatory system, Regional circulation-coronary, Splanchnic, cerebral, capillary, foetal and pulmonary circulation. Physiology of shock, coronary artery disease, hypertension, Cardio-pulmonary resuscitation, Lymphatic circulation.

Unit-IX - Respiratory system :

Functional anatomy of respiratory system, physical principles of gaseous exchange, Transport of respiratory gases, Mechanics of normal respiration, Pulmonary ventilation, Ventilation-Perfusion Ratio, Regulation of respiration, Lung function test-clinical significance, Principles of artificial respiration, oxygen therapy, acclimatization at high altitude and decompression sickness. Hypoxia, Space physiology cyanosis and asphyxia. Haemo-respiratory changes during exercise and Yoga.

Unit-X - Central Nervous System :

Organization of nervous system. Functions, types and properties of synapse, reflex and receptors. Motor and sensory system and its applied aspects. Neurophysiology of cortex, basal ganglia, thalamus, hypothalamus, cerebellum, limbic system and reticular activating system. Parkinsonism. Mechanism of maintenance of tone, posture and equilibrium, Vestibular apparatus, Higher functions - Memory, Learning inclusive of conditioned reflexes, Speech. Sections of spinal cord, EEG and Sleep. Neuro-physiology of Pain. C.S.F. Autonomic nervous system.

Unit-XI - Special Senses :

Functional anatomy of eye - Physiology of image formation, photo transduction, colour vision, refractive errors, Visual reflexes-pupillary and light reflex, Visual pathways and Visual field defects. Functional anatomy of ear, properties of sound, mechanism of hearing and deafness, Hearing Test. Perception of smell and taste sensation, pathways and its applied. Auditory & visual evoked potential.

Unit-XII - Skin and Body Temperature Regulation :

Mechanism of temperature regulation, Adaptation to altered temperature (heat and cold), Mechanism of fever, cold injuries and heat stroke.

Unit-XIII - Physiology of Sports, Exercise, Yoga and Meditation :

Cardio-respiratory and metabolic adjustments, Physiological effects of yoga and meditation.

Unit-XIV - Physiology of Ageing :

Physiological and Psychological changes of ageing and theories of ageing.

* * * * *

Pattern of Question Papers:

1. Objective Type Paper
2. Maximum Marks : 180
3. Number of Questions : 180
4. Duration of Paper : Three Hours
5. All Questions carry equal marks
6. There will be Negative Marking

* * * * *