

Syllabus for the post of

Tutor in General Physiology Class-II (Dental) (Advt. No. 05/2021-22)

Marks – 200

Questions – 200

Medium - English

1. Anatomy

Introduction to Anatomy, nomenclature, anatomical position, planes, tissues and movements, Osteology, Muscular System, Arthrology, Cardio Vascular System, Respiratory System, Digestive System, Genito-Urinary System, Endocrine System and Individual Endocrine Glands, Nervous System and its components, Special sensory Organs, Lymphatic System, Surface Anatomy, Cross Sectional Anatomy, Microanatomy: Microscope and basic principles of microscopy, commonly used stains, basophilic and acidophilic staining reactions and their significance, Commonly encountered artifacts, Brief principle of electron microscopy and interpretation of ultrastructural features.

2. General Physiology

- Mutual introduction of dramatis personae in the teaching learning process
- Know thy institute
- Physiology: what and why? Homeostasis: an evolutionary point of view
- Characteristics of control systems
- Looking back & forth
- Reading efficiently

3. Nerve–Muscle

- Physicochemical properties of cell membrane
- Cell membrane: permeability & transport
- Principles of bioelectricity
- Genesis of resting membrane potential
- Action potential
- Properties of nerve-fibres
- Functional anatomy of neuromuscular junction
- Neuromuscular transmission
- Muscle proteins – (Biochemistry)
- Excitation – contraction coupling
- Contraction kinetics of skeletal muscles
- Smooth muscle

- Injury & repair of nerves and muscles
- Energetics of nerve & muscle
- Work Physiology

4. Blood

- Functions of plasma proteins
- Principles of hemopoiesis
- Regulation of erythropoiesis
- Destruction of red cells: Jaundice
- Anemia
- Regulation of WBC production
- Functions of WBC
- Functions of platelets
- Hemostasis
- Blood groups
- Physiological basis of transfusion medicine

5. Respiratory System

- Introduction to respiratory system
- Lung volumes and capacities
- Mechanics of respiration – I
- Mechanics of respiration – II
- Composition of respired air: pulmonary ventilation
- Exchange of gases in the lungs
- Ventilation – perfusion ratio
- O₂ carriage, O₂-dissociation curve
- CO₂ carriage, CO₂-dissociation curve
- Neural regulation of respiration
- Chemical regulation of respiration
- Hypoxia, cyanosis and dyspnoea
- Special features of pulmonary circulation
- Artificial respiration Artificial respiration
- Therapeutic use of oxygen

6. Cardiovascular System

- Introduction to CVS
- Properties of cardiac muscle
- Action potential and spread of impulse in the heart
- E-C coupling in the myocardium
- ECG
- Pressure changes in the heart. Cardiac cycle
- Functional basis of heart sounds and murmurs
- Neural regulation of cardiac activity
- Regulation of heart rate
- Intrinsic regulation of heart's action. Cardiac output
- Cardiac output: measurement and regulation
- Nutrition and metabolism of heart
- Exercise physiology
- General principles of hemodynamics
- Cardiovascular reflexes
- Neural control of circulation
- Special features of cerebral circulation
- Special features of circulation in skeletal muscles and skin

7. Gastrointestinal System

- Introduction to G.I. Physiology: general organization of G.I. tract
- Mastication and deglutition
- Gastric secretion
- Regulation of gastric secretion
- Pathophysiology of peptic ulcer
- Biliary and pancreatic secretions
- Physiology of colon
- Pathophysiology of diarrheal disease

8. Nutrition

- Introduction to nutrition. RMR
- Carbohydrates and dietary fiber
- Proteins
- Fats

- Recommended dietary allowances
- Diet during pregnancy and lactation
- Diet during infancy and childhood

9. Environmental Physiology

- Introduction to environmental physiology
- Body temperature regulation
- Man in cold environment
- Man in hot environment
- Hypothermia and its clinical applications
- Physiological responses to high altitude
- Physiological responses to high atmospheric pressure

10. Reproduction

- Introduction to reproductive system
- Male reproductive physiology
- Female reproductive physiology
- Hypothalamic – pituitary – gonadal axis
- Puberty
- Pregnancy
- Parturition and lactation
- Reproductive ageing

11. Kidney

- Renal hemodynamics and glomerular filtration
- Renal tubular function – I
- Renal tubular function – II
- Regulation of renal function
- Physiological basis of renal function tests
- Micturition

12. Neurophysiology

➤ **General**

- Introduction to neurophysiology I
- Introduction to neurophysiology II
- CSF

- Neuroglial cells
 - Synaptic transmission
 - Properties of synaptic transmission
 - Neurotransmitters
- **Sensory system**
- Coding of sensory information
 - Functional organization of ascending sensory pathways
 - Thalamus
 - Sensory cortex
 - Perception of sensory stimuli
 - Physiology of pain
- **Motor system**
- Characteristics and properties of reflexes
 - Functional organization of motor system – I
 - Functional organization of motor system – II
 - Brain stem reflexes, stretch reflexes and tendon reflexes
 - Basal ganglia
 - Cerebellum
 - Vestibular neck reflexes: maintenance of equilibrium
 - Localizing the level of lesion in neurological disease
- **Visceral and motivational system**
- Autonomic nervous system
 - Hypothalamus
 - Limbic system and emotions
- **EEG, sleep and higher nervous functions**
- Electroencephalography
 - Sleep and wakefulness
 - Learning and memory – I
 - Learning and memory – II
 - Speech
- **Special Senses**
- Functional anatomy of eye

- Functions of retina: photoreception
- Functions of retina: colour vision and electroretinography
- Central mechanisms of vision and visual perception
- Functional anatomy of ear: impedance matching
- Organ of Corti: peripheral auditory mechanism
- Auditory pathway
- Central auditory mechanism and auditory perception
- Olfaction
- Physiology of taste

13. Yoga

- Introduction to yoga
- The yogic practices
- Meditation: principles and practice
- Physiological effects of yoga
- Yoga in health and disease

14. Medico Legal Aspects Relevant to the Discipline.

15. Indian Medical Council (Professional Conduct ETIQUETTE and Ethics) Regulations, 2002.

16. Current Trends and recent advancements in the Field of Physiology.