SAI TIRUPATI UNIVERSITY

Syllabus for Ph.D. Entrance Examination

Physiology

1. **History of Physiology & General Physiology**- History of Physiology, Comparative animal physiology, Biophysics principles, Bioelectric potentials**,** Regulations of Body fluids & electrolyte & applied aspects.

2. **Muscle and Nerve Physiology.**

3. **Blood** – its composition and functions, blood volume, plasma proteins and its functions, coagulation of blood, Blood groups, Transfusions, Hemorrhage and shock, Origin of blood cells, Bone marrow, Haemoglobin and its derivatives.
4. **Cardiovascular system**- General organization of CVS, Physiological anatomy of Heart, Cardiac muscle, Excitatory and Conducting tissue, Electrocardiography, Normal ECG & abnormal ECG, Cardiac Cycle, Heart sounds , Heart rate and its regulation, Hemodynamics of blood flow, Arteries and Arterioles, Blood pressure, its regulation, applied, Microcirculation, Local Blood Flow Regulation, Lymphatic system, Oedema, Cardiac Output, Venous Return, Coronary Circulation; Ischemic heart disease, Cardiac failure, Circulatory Shock, Congenital heart Disease, Regional Circulations, Effect of exercise on CVS.

5. **Respiratory system**- Mechanics of respiration, Compliance, Surfactant, Lung volumes and capacities, Dead space, Diffusion of Gases, Respiratory membrane, Transport of O_2, Oxygen–hemoglobin dissociation curve, Transport of CO_2 , Neural control of Respiration, Chemical control of Respiration, Pulmonary Circulation, Ventilation perfusion ratio, Hypoxia, Respiratory adjustments in exercise, Artificial Respiration, Pulmonary function Test.

6. **Digestive system**- Balanced diet, food, nutrition, Vitamins, various secretions of the digestive tracts, their functions, movements of the alimentary canal and absorption.

7. **Excretory system**- Structure of kidney, formation of urine, Physiology of Micturition, body temperature regulation, Structure and functions of skin, Body fluids and their regulation, Acid base balance

8. **Endocrines and Reproduction**- Physiology of various endocrine glands, male and female sex hormones, menstruation, ovulation and physiology of pregnancy.

9. **Central Nervous System-**General organization of Nervous System, Structural and Functional divisions and Levels, Synapse, Receptors, Ascending Tracts, Physiology of pain, Internal analgesia system, Sensory Cortex,Autonomic nervous system, Thalamus, Motor system – Organization and different motor components, Spinal cord – Organization for motor functions, Cord reflexes, Spinal shock, Reflexes, Muscle Spindle and Golgi tendon organs, Motor Cortex, Descending Tracts, Upper motor Neuron Lesion , Lower Motor Neuron Lesion, Brain stem – Role in control of Motor functions, Vestibular apparatus and brainstem nuclei, Maintenance and regulation of tone, posture and equilibrium, Cerebellum and its motor function,

Basal Ganglia and its motor functions, Parkinson's disease, Higher function of the brain- learning, Memory, Language, Limbic system, Hypothalamus, Reticular activating system, Electroencephalogram, Sleep, Cerebral blood Flow and Cerebrospinal fluid.

10.Special Senses- Physiology of vision, hearing, taste and smell

11.**Physiology of Growth,Development and Aging**.

12.**Genetics :An Overview**

13.Yoga & Meditation- Yoga Asanas, Physiological Effects of Yoga, Physiological Effects of Meditation, Health Benefits of Yoga & Meditation.

14.Environmental Physiology- Physiology at High attitude, Hyperbarism, Regulation of body temperature, Space Physiology; Environmental pollution- radiation, smoke, noise, industrial.