Syllabus for Ph.D. Entrance

Clinical Research

Module 1: Type of variables, Data entry and presentation, Summarization of data, Frequency distribution, Measures of central tendency, Variability measures, Probability, Hypothesis testing: Null and Alternative hypothesis, Type I and Type II errors. Level of Significance,

Module II: Acid- base reactions, buffer, water, Organic reaction mechanisms, Calorific values, Respiratory quotient, Basal metabolic rate, Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides, Peptide bond, biologically important peptides, isoelectric pH, properties of amino acid and structural organization of protein. Enzyme kinetics, Electron transport chain Oxidative phosphorylation and uncouples. Structure, properties of purines and pyrimidine bases, Conformation of Nucleic acids (A, B, Z-DNA, tRNA, micro-RNA), Stability of Nucleic acid structure Kidney function tests, Liver function tests, Cardiac markers, ELISA, PCR, DNA based diagnostics.

Module III: Dose–response relationship, Pharmacokinetics of drug absorption, distribution, biotransformation, excretion and toxicity, Factors influencing drug metabolism of drug action, Drug safety; Factors influencing the objectively demonstrated response, Pharmacodynamic. Bioavailability and Bioequivalence, Drug Development, Discovery of New Drugs.

Module IV: Composition and functions of blood, Blood elements, Anatomy and functions of heart, Blood vessels and circulation (Pulmonary, coronary and systemic circulation). Electrocardiogram (ECG), Cardiac cycle and heart sounds, Blood pressure – its maintenance and regulation. Physiological anatomy of GIT and its functions, Composition and functions of different digestive juices. Digestion and Absorption in GIT. Physiological anatomy of kidney and excretory system. Physiology of micturition and regulation of body temperature in humans. Anatomy and physiology of various parts of central nervous system. Brain and its parts, functions and reflex action, Anatomy and functions of sympathetic and parasympathetic nervous system, Physiology of neuromuscular junction and muscle contraction. Physiological functioning of respiratory organs, Transport of respiratory gases, Different endocrine glands and their functions, Puberty, Spermatogenesis; semen. Menstruation, ovulation and contraception.

Module V: Classification of microorganisms, basic concepts- normal flora, probiotics, colonization, Infection and sterilization. Introduction, classification, general features, Pathogenicity, diagnosis, treatment and prevention of common bacterial, viral, fungal and parasitic infections. Innate and adaptive immunity, Cell and Tissue response to injury, hypertrophy, hyperplasia, necrosis, apoptosis, Inflammation and Healing. Hypersensitivity reactions, Examination of body fluids and secretions.