

## Syllabus for Entrance Test - Admission to Ph.D. Programme

The question – cum answer booklet will have two parts. Part I will consist of 50 multiple choice questions (MCQ) to test the research aptitude of candidates. Part II will also consist of 50 multiple choice questions (MCQ) to test the domain knowledge of candidates. The syllabus for Part I for all Ph.D. programmes will be same. The questions will be of Master's degree level. The syllabus for Part I and Part II is given below:

Part I will cover general principles of research including formulation of hypothesis and its testing, development of research plan and biostatistics which covering following content:

- a) **Planning of Research:** planning process, selection of a problem for research, formulation of the selected problem, hypothesis formation, measurement, research design and plan.
- b) **Tools of data collection:** Type of data, construction of schedules and questionnaires, measurement of scales and indices, pilot studies and pre-tests.
- c) **Sampling:** sampling techniques or methods, choice of sampling techniques, sample size, sampling and non-sampling errors. Sampling variability and significance: testing statistical hypothesis, tests of significance, Z-test, one-tailed and two tailed tests.
- d) **Methods of data collection:** Meaning and importance of data, sources of data, uses of secondary data, methods of collecting primary data, observation method.
- e) **Variability and its measures:** Types, biological, real, experimental, measures of variability, range, semi-interquartile, range (Q), mean deviation, standard deviation (SD), coefficient of variation (CV), standard error of mean, applications and uses, standard error of difference between two means of large sample, small sample, t-test unpaired, paired, variance ratio test, analysis of variance.
- f) **Probability:** Addition law of probability, multiplication law, binomial probability distribution, probability chance from shape of normal distribution or normal curve.
- g) **The Chi-square Test:** Alternate test to find significances of difference in two or more than two proportions, as a test of association between two events in binomial or multinomial samples, as a test goodness of fit, calculation of  $\chi^2$  value, restrictions in application of  $\chi^2$  test, Yates corrections.

### **Part II. Subject wise syllabus is given below**

#### **1. Anatomy**

General Anatomy, histology, Embryology, Neurology- Brachial Plexus, Radial, Median, Ulnar, Axillary & Musculocutaneous Nerve Mammary gland, blood Vessels, Neurology – Lumbar & Sacral plexus formation sciatic, femoral, obturator, tibial and common, peroneal Nerve & blood vessels, Peritoneum, Abdominal Organs – stomach ,spleen, liver, billiary, apparatus, pancreas, small & large Intestine, kidneys ureters, suprarenal glands, Glands – Thyroid, Parathyroid, parotid, submandibular, sublingual, pituitary Viscera –Scalp, palatine tonsil, Middle ear, Part of External and internal ear, Meninges, fetal Skull, Subclavian, Carotid system, Ext & Internal, Jugular veins, venous sinuses, Lymphatic drainage of head & neck, Cranial Nerves, branches & cervical plexus, Brain & Neuroanatomy, Human Genetics.

#### **2. Biochemistry**

Structure of atoms, molecules and chemical bonds. Composition, structure and function of biomolecules: Carbohydrates, lipids, proteins, nucleic acids and vitamins. DNA, RNA and Protein synthesis. Stabilizing interactions: Van der Waals, electrostatic, hydrogen bonding,

hydrophobic interaction, etc. Principles of biophysical chemistry: pH, buffer, reaction kinetics, thermodynamics, colligative properties. Bioenergetics, glycolysis, oxidative phosphorylation, coupled reaction, group transfer, biological energy transducers. Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes. Conformation of proteins: Ramachandran plot, secondary structure, domains, motif and folds. Conformation of nucleic acids: Helix (A, B, Z), t-RNA, micro-RNA. Stability of proteins and nucleic acids. Metabolism of carbohydrates, lipids, amino acids nucleotides and vitamins.

### **3. Microbiology**

Introduction to Bacteriology and morphology of bacteria, Growth and Nutrition of Bacteria, Bacterial Genetics, Sterilization and Disinfection, Culture media and Culture Methods, Microbial Pathogenicity, Antimicrobial agents, their mode of action and resistance, Bacterial Taxonomy. Microbial diseases: Tuberculosis, AIDS, candidiasis, malaria. Important diseases of plants: Downy mildew of pearl millet, panama wilt of banana, bacterial leaf blight of rice, TMV. Antibiotics: Types, mode of action and resistance. General outline and classification of viruses, bacteriology. Mycology: Introduction and classification of fungi and fungal diseases. General Virology/Properties of Viruses. Infection and Immunity, Antigens, Antibodies–Immunoglobulin (Monoclonal Antibodies), Antigen–Antibody Reactions, Complement system, Structure and Functions of the Immune system, Immune response–Humoral and cellular, Hypersensitivity, Histocompatibility system.

### **4. Nursing Sciences**

Current trends and issues in Child Health Nursing, Pre-natal Pediatrics and Growth & Development of children, Behavioral and Preventive Pediatrics, Community Health Nursing: Community Health Nursing Trends & Issues, Population dynamics and control, Epidemiology, National Health and Family Welfare Programmes, IMNCI (Integrated Management of Neonatal and Childhood Illness) module, Medical Surgical Nursing, Current trends in Adult Health Nursing, Health Assessment and care of patients in hospital setting, Management of patients with disorders of gastro intestinal tract, nervous system, respiratory system, cardio vascular system, blood, genito urinary system, endocrine system, musculo – skeletal system, integumentary system, Eye & ENT and reproductive system, Geriatric nursing, Emergency, trauma and multi system organ failure, Current trends and issues in Mental Health Nursing, Stress Management and Therapeutic Communication & Interpersonal relationship, Psycho Social and Physical Therapies, Psychiatric disorders, Substance related disorders, Obstetrics & Gynecological Nursing, Current trends and issues in Maternal Health Nursing, Pregnancy, Normal Labour and Puerperium & Nursing Management.

### **5. Physiology**

General physiology, body fluids and blood, nerve and muscle, gut and nutrition, excretory system, skin and body temperature, respiratory system, cardiovascular system, endocrine glands, reproductive system, nervous system, special senses.