Faculty of Medicine

PART A – Research Methodology (Q.1–35)

1. Foundations of Research

- Definition, objectives, scope of research
- Types of research – qualitative, quantitative, experimental, applied, fundamental
- Research ethics – consent, confidentiality, plagiarism

2. Research Problems &Hypothesis

- Formulation of research problem
- Hypothesis – null, alternate, simple, composite
- Variables – independent, dependent, confounding

3. Research Designs &Sampling

- Study designs – descriptive, experimental, cohort, case-control, cross-sectional, longitudinal, RCTs
- Samplingmethods–probability(simple,stratified,cluster,systematic)andnon-probability(quota,purposive, convenience)
- Sample size determination and bias control

4. Data Collection &Measurement

- Tools: questionnaire, interview, observation, case records, psychological tests, rating scales
- Reliability and validity
- Levels of measurement – nominal, ordinal, interval, ratio

5. Statistics & Data Analysis

- Descriptive statistics – mean, median, mode, SD, variance
- Inferential statistics – chi-square, t-test, ANOVA, correlation, regression
- Nonparametric tests – Mann–Whitney, Kruskal–Wallis
- Confidence intervals, p-value, Type I & II errors

6. Epidemiology & Public Health Tools

- Incidence, prevalence, relative risk, odds ratio
- Screening tests – sensitivity, specificity, predictive values
- Epidemiological indices – HDI, PQLI, GII
- Herd immunity and vaccination principles

7. Qualitative & Evidence-Based Research

- Phenomenology, grounded theory, ethnography, case study
- Systematic reviews, meta-analysis, evidence hierarchy

8. Research Reporting &Referencing

- Thesis/dissertation structure
- Referencing styles – Vancouver, APA, Chicago
- Bibliography and plagiarism awareness

PART B – Subject-Specific Specializations (Q.36–70)

Anatomy

- Gross anatomy – head, neck, thorax, abdomen, pelvis, extremities
- Neuroanatomy – brainstem, cranial nerves, cerebellum,cerebrum, internal capsule (delete the word internal capsule), spinal cord, ventricles, blood supply
- Histology – epithelium, connective tissues, organs (delete the words); Instead add - General & Systemic Histology
- Embryology – development of systems, congenital anomalies
- Genetics – chromosomal abnormalities and syndromes
- Applied anatomy and clinical correlations

Physiology

- General physiology – membranes, transport, homeostasis, body fluids
- Blood – RBC, WBC, platelets, coagulation, blood group
- Nerve-muscle physiology – action potential, NMJ, EMG, muscle contraction
- Cardiovascular system – cardiac cycle, ECG, BP regulation, cardiac output, shock
- Respiratory system – mechanics, gas exchange, regulation
- Renal physiology – GFR, tubular functions, acid-base balance, urinary bladder & disorders
- Endocrinology and reproductive physiology
- CNS – reflexes, higher functions, sensory systems, motor systems
- Applied and clinical physiology

Biochemistry

- Biomolecules, enzymes, metabolism of carbohydrates, lipids, proteins and heme
- Molecular biology and genetics
- Nutrition, vitamins, trace elements
- Immunochemistry and cancer biology
- Free radicals, antioxidants, xenobiotics
- Clinical biochemistry – diabetes, renal, liver, cardiac markers, endocrinology, toxicology (replace the word 'toxicology' with heavy metal poisons and environmental pollution)
- Recent advances in biochemistry
- Applied laboratory biochemistry

Pharmacology

- General pharmacology – PK/PD, receptors, dose-response relationships, adverse drug reaction,clinical trials, animal trials
- Autonomic and cardiovascular pharmacology
- CNS pharmacology - delete the words and add - Neuropharmacology – antiepileptics, anesthetics, antipsychotics, antidepressants, Analgesics, CNS stimulants
- Endocrine pharmacology – insulin, thyroid, steroids, estrogen, progesterone and their antagonists
- Chemotherapy – antibiotics, antivirals, antifungals, antiprotozoal drugs, anticancer drugs
- Toxicology and antidotes
- Renal and Respiratory pharmacology
- Immunopharmacology
- Clinical and experimental pharmacology
- Bioassays and immunoassays
- Instruments used in pharmacology
- Drug discovery
- Recent advances in pharmacology
- Biostatistics

Pathology

- General pathology – cell injury, inflammation, repair, neoplasia, hemodynamic disorders
- Genetics
- Immunopathology and molecular pathology
- Environmental & nutritional disorders
- Infectious diseases
- Systemic pathology – respiratory, GIT, hepatobiliary, renal, endocrine, CNS, breast, reproductive systems, Blood vessels & CVS
- Hematology, transfusion medicine, blood banking, Bones & Joints
- Laboratory medicine – histopathology, cytology, automation, quality control
- Recentadvances– moleculardiagnostics,immunohistochemistry,digitalpathology,cytogenetics,applied immunopathology

General Medicine-

- Applied basic sciences relevant to internal medicine, pathophysiology and management of major systemic diseases, including cardiovascular, respiratory, renal and endocrine diseases. Neurology, haematology, rheumatology, infectious diseases and critical care medicine and metabolic disorders focusing on diagnostic reasoning, laboratory correlations and therapeutic approaches. Recent advances and evidence-based clinical practices incorporate molecular diagnostics, biomarkers, genomics, artificial intelligence in healthcare, and clinical epidemiology.

Psychiatry-

- Foundations of Psychiatry – neurobiology, psychology, and classification systems.- Clinical psychiatry – schizophrenia, mood, anxiety, and personality disorders, OCD, Dissociative Disorders, Somatoform Disorders, Eating Disorders, Substance abuse and Addiction Psychiatry, Human Sexuality and its Disorders..- Child, geriatric, forensic, and community psychiatry.- Neuropsychiatry and medicine interfaces.- Recent advances in psychotherapy, psychopharmacology, and research methodology.

Community Medicine-

- Principles of public health, epidemiology, and disease prevention.- Communicable and non-communicable disease control.- Environmental health, nutrition, and sanitation.- Health systems, policies, and health economics.- Social and behavioral sciences in health and ethics in research.
- Demography & Family planning,Preventive Obstetrics,Paediatrics and Geriatrics ,Health Planning & Management and National Health Programmes in India

Microbiology-

- General microbiology, sterilization, and immunology.- Systemic bacteriology, virology, mycology, and parasitology.- Applied microbiology and infection control.- Antimicrobial resistance and hospital-acquired infections.- Molecular diagnostics, biosafety, and recent advances.

Anaesthesiology-

- Applied anatomy, physiology, and pharmacology relevant to anaesthesia.- General and regional anaesthesia – principles and practice.- Critical care medicine and pain management.- Anaesthesia for specialty procedures (neuro, cardiac, obstetric, pediatric).- Research methodology, patient safety, and recent technological advances