

Faculty of Physiotherapy

Part A – Research Methodology

1. Foundations of Research

- Objectives of research, Research problem, Hypothesis, Variables
- Types of research
- Ethics in research
- Research proposal: structure, problem identification, objectives, hypothesis framing

2. Research Design and Sampling

- Research designs (Non-Experimental, Experimental, Quasi-Experimental)
- Sampling techniques: probability & non-probability, sample size estimation
- Bias & confounding

3. Data Collection and Tools

- Questionnaire development, pilot testing
- Outcome measures in physiotherapy – Reliability & Validity of tools.
- Measurement scales – nominal, ordinal, interval, ratio

4. Biostatistics

- Measures of central tendency and dispersion
- Inferential statistics (Parametric & Non-Parametric Tests)
- Probability, confidence intervals, p-value, effect size, power analysis
- Type I and II errors
- Diagnostic accuracy – sensitivity, specificity, predictive values

5. Data Presentation & Academic Writing

- Graphs: bar charts, histograms, scatter plots
- Interpretation and presentation of results
- Writing research reports, abstracts, and manuscripts
- Citation and referencing styles

PART B – Physiotherapy (Q.36–100)

1. Exercise Therapy – Principles and Applications

- Basic Concepts – ROM, flexibility, strength, endurance, coordination, balance.
- Types of Exercises – Passive, active-assisted, active, resisted exercises.
- Principles of Exercise Prescription – FITT principles, overload, progression, specificity, reversibility.
- Therapeutic Exercise Techniques – Stretching, PNF, Pilates, aquatic therapy, and core stabilisation.
- Posture and Gait Training – Postural correction, ergonomic advice, gait analysis and re-education.
- Exercise in Special Conditions – Orthopaedic, neurological, geriatric, and cardiopulmonary disorders.
- Outcome Measures – Assessment tools for functional improvement.

2. Electrotherapy – Fundamentals and Applications

- **Basic Principles of Electro physics** – Electricity, current flow, impedance, capacitance, frequency, intensity.
- **Tissue Response to Electricity** – Excitability, depolarisation, nerve and muscle stimulation.
- **Modalities of Electrotherapy** –
 - **Low Frequency Currents:** Faradic, galvanic, TENS, NMES.
 - **Medium Frequency Currents:** Interferential Therapy (IFT), Russian currents.
 - **High Frequency Currents:** Short Wave Diathermy, Microwave, Ultrasound, Laser Therapy, Shockwave therapy, cryotherapy, biofeedback, and electrodiagnosis.
- **Safety and Contraindications** – Electrical safety, precautions, and clinical implications.

3. Biomechanics and Kinesiology

- **Basic Principles** – Kinetics, kinematics, levers, centre of gravity, equilibrium, friction, and mechanical advantage.
- **Biomechanics of Human Movement** – Analysis of joints (shoulder, spine, hip, knee, ankle).
- **Gait and Posture Analysis** – Normal and pathological gait, postural deviations, compensatory mechanisms.

- **Ergonomics and Human Performance** – Work-related musculoskeletal disorders, ergonomic adaptations.
- **Instrumentation and Motion Analysis** – Goniometry, EMG, and force plates.

Unit 4: Musculoskeletal and Neurological Physiotherapy

- **Assessment and Evaluation** – Subjective/objective examination, functional testing.
- **Musculoskeletal Conditions** – Fractures, arthritis, post-operative rehabilitation, soft tissue injuries.
- **Neurological Conditions** – Stroke, spinal cord injury, Parkinson's disease, peripheral nerve lesions.
- **Manual Therapy Approaches** – Maitland, Mulligan, McKenzie, Cyriax, Muscle Energy Techniques.
- **Rehabilitation Protocols** – Pre- and post-surgical rehabilitation, sports injury management, chronic pain management.

Unit 5: Cardiopulmonary and Community Physiotherapy

- **Cardiopulmonary Assessment** – Inspection, Palpation, Auscultation, Percussion.
- **Cardiopulmonary Conditions** – Obstructive and Restrictive Lung Diseases, Congenital and Acquired Heart Diseases.
- **Cardiopulmonary Rehabilitation Techniques** – Breathing exercises, Airway clearance techniques, Exercise tolerance test.
- **Community-Based Rehabilitation (CBR)** – Principles, models, implementation.