

**BHARATI VIDYAPEETH  
(DEEMED TO BE UNIVERSITY), PUNE, INDIA  
PhD Entrance Test – 2024**

**SECTION-II: Physiotherapy - 35 Marks**

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**A. Professional Practice, Ethics and Administration:-**

1. Development of Physiotherapy Profession
2. Laws governing physiotherapy practice
3. Ethical issues in practice of physiotherapy-Clinical, Research and Academics.  
Ethics in Physiotherapy practice, clinical and research, code of conduct for safe disciplined practice – legal aspect, Rights and responsibility of physiotherapist and client, PWD Act. Rules and regulations governing physiotherapy practice- National & International Administration, legislation, rules and regulations governing physiotherapy practice- National & International.
4. Administration - Physiotherapy Management in Hospital, community & Industry. Principles of management, planning, organisation, budget, policy procedures and quality assurance. Setting up a physiotherapy department.
5. Physiotherapist as a leader and manager.
6. Scope of Physiotherapy in Hospital, Community & Industry and Future challenges in physiotherapy.
7. Roles of the physiotherapist as per WCPT/WHO
8. Standards for practice for physiotherapist and the criteria as competency statements
9. Communication skills, leadership quality & teamwork. Importance of documentation, types of documentation systems, documentation of professional assessment including International Classification of Functioning Disability & Health (ICF) format.
10. Professionalism
11. Align physiotherapy objectives with the goals of national health

## **E. RESEARCH METHODOLOGY AND BIostatISTICS :**

### **RESEARCH METHODOLOGY**

1. Introduction to research
2. Types of research
3. Defining a research question
4. Qualitative study designs: Grounded theory and Phenomenological methods.
5. Use of Delphi process
6. Quantitative study
7. Type I and type II bias
8. Study design: types
  - a. Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.
9. Sampling design, calculating minimum sample size based on design
10. Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.
11. Outcome measures: Use of outcome measures in rehabilitation research
12. Research Methods: Designing methodology, Reporting results,
13. Communicating research.
14. Evaluating published research: looking at the evidence
15. Introduction to evidence based practice, evaluating evidence,
16. Asking clinical questions
17. Translating of evidence into practice: strategies
18. Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

### **APPLIED BIostatISTICS**

1. Descriptive Statistics and measurement variability
2. Statistical inference
3. Comparison of group means: T-test
4. Analysis of variance
5. Multiple comparison tests
6. Non parametric tests
7. Correlations
8. Regression
9. Analysis of frequencies: Chi square
10. Statistical measure of reliability
11. Power analysis – Determining sample size
12. Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio.

## **SCIENTIFIC WRITING**

1. Definition and kinds of scientific documents – Research paper, Review paper, Book, Reviews, Thesis, Conference and project reports (for the scientific community and for funding agencies).
2. Publication – Role of author, Guide, Co-authors.
3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research
4. Significance of Report writing; Different steps in Report writing; Mechanics and precautions of writing research reports Oral and poster presentation of research papers in conferences/symposia; Preparation of abstracts.
5. Structure of Thesis and Content – Preparing Abstracts.

## **Applied Physiotherapeutics Paper I:**

### **Applied Biomechanics & Clinical Kinesiology.**

1. Normal and applied Biomechanics of Tissues and structures of the body systems  
(includes biomechanics of musculoskeletal system).
2. Applied and altered physiology of functions of the body system
3. Clinical kinesiology of posture and gait
4. Ergonomic Approach to lifting and handling, transfer techniques, workspace and environment modification, increasing accessibility, capacity and performance
5. Movement analysis
6. Laboratory evaluation of kinetics and kinematics
7. Neurophysiology of Pain, Mechanisms of Referred Visceral Pain, Central mechanism and processing of Pain, Multi-segmental Innervations

### **Exercise Physiology & Nutrition:**

1. Energy, Energy Transfer and Energy Expenditure at rest, activity and disease
2. Physiology of Movement
3. Responses and Adaptations of various systems to Exercise and training.

4. Environmental influence on Performance.
5. Body composition, nutrition and caloric balance and performance
6. Physiological variations with exercise and training.
7. Components of exercise programming.
8. Fatigue assessment and scientific organization of work-rest regimes to control fatigue.
9. Introduction to Sports sciences and sports medicine
10. Psychological aspects of exercise
11. Nutritional requirements and supplementation in health and disease.
12. Benefits of exercise in health and disease
13. Exercise Advocacy for common population

**Electrophysiology and electro diagnosis:**

1. Clinical decision making in electrotherapeutics -characteristics and components of Electro therapeutic stimulation systems and Electro Physiological assessment devices.
2. Instrumentation for neuromuscular electrical stimulation.
3. Muscles plasticity in response to electrical stimulation.
4. Electrical stimulation and its effects on various systems.
5. Clinical Electro physiological testing and clinical interpretation
6. Use of electrodiagnosis in prognostification
7. EMG and Biofeedback

**Applied Physiotherapeutics Paper II**

**Physiotherapy/Functional Diagnosis& Clinical reasoning:**

1. Clinical examination in general and detection of movement dysfunction.
2. Principles of pathological investigations and imaging techniques related to neuromuscular-skeletal and cardiopulmonary disorders with interpretation.
3. Developmental screening, motor learning –motor control assessment.

4. Anthropometric measurements.
5. Physical fitness assessment - Body composition, Flexibility, Muscle strength, endurance, Cardio-respiratory endurance. Skills, Testing of agility- balance, co-ordination.Evaluation of health related fitness and performance based measurements.
6. Evaluation Methods, Special tests used in Musculoskeletal, Neurological and Cardiopulmonary disorders.
7. Biophysical measurements, physiotherapy modalities, techniques and approaches.
8. Aids and appliances, adaptive functional devices to improve movement dysfunction.
9. Physical disability evaluation and disability diagnosis.
10. Evaluation of Posture and Gait abnormalities with reasoning
11. Pain (assessment, modulation and management of pain)  
Assessment of Pain and Symptoms: Sources of Pain, Types of Pain, Comparison of Systemic Versus Musculoskeletal Pain, Patterns, Characteristics of Viscerogenic Pain, Screening for Emotional and Psychologic Overlay, Pain modulation using electrotherapy
12. Assessment and clinical decision making in elderly
13. Basic investigations to identify system abnormalities
14. Identification of scope of practice and referral
15. Introduction to Screening for Referral in Physiotherapy
16. Using the Screening Model, Reasons to Screen, Screenings and Surveillance, Diagnosis by the Physiotherapist, Differential Diagnosis versus Screening
17. Direct Access, Red flags and Physician referral
18. Decision-Making Process Case Examples and Case Studies.
19. Physical assessment as a screening tool to identify the source of symptoms :General systems screening and examination, including endocrine, metabolic, immunologic systems, Screening for Systemic Versus Psychogenic Symptoms
20. Introduction to the interviewing process: Concepts in Communication ,Cultural Competence, The Screening Interview ,Subjective Examination , Core Interview ,Hospital Inpatient Information.
21. Integrating ICF into clinical practice
22. Assessing functioning and Quality of life

### **Evidence based Practice:**

1. Sacketts -steps in evidence based practice- theory and practicals.
2. Performing a literature search
3. Critically appraising evidence, RCT, Systematic review, other studies
4. Shared decision making
5. Linking evidence to practice

## **Advanced Physiotherapeutic approaches :**

1. Maternal and child care in general physiotherapy.
2. Principles of Neurological approaches, Theories of motor control and motor learning.
3. Pharmaco-dynamics and activity performance.
4. Advanced theories and application of Therapeutic exercise.
5. Application of advanced electrotherapy modalities & techniques on patients, monitoring of dosages and winding up procedure. Safety considerations in electrotherapy
6. Ergonomic consideration during physiotherapy.
7. Preparing Plan of care to achieve functioning , discharge, social participation
8. Physiotherapy for health and stress management.
9. Manual therapy, soft tissue mobilizations and its application
10. Physiotherapy perspective in onco rehab, Disaster management and emergency, Plastic Surgery and burns, common conditions of skin, Obstetric and Gynecological Disorders
11. CPR, monitoring systems and defibrillators and artificial respirators.
12. Integration of Yoga in Physiotherapy for Health promotion and Dysfunction
13. Community practice in physiotherapy
14. Alternative therapies

## **Specialty Syllabus:**

### **Musculoskeletal Physiotherapy**

#### **Advances in Musculoskeletal Physiotherapy – (Part I)**

(Musculo-skeletal Dysfunctions of the Upper Quadrant)

(Upper Quadrant includes cervical spine, thoracic spine, shoulder girdle and upper extremities)

1. Anatomical, Physiological and Biomechanical basis for assessment of movement dysfunctions of the upper quadrant
2. Patho-physiological and Patho-mechanical basis for management of movement dysfunctions of the upper quadrant
3. Clinical decision making skills in evaluation & management of all pediatric, adult and geriatric dysfunctions of the upper quadrant
4. Advances in functional diagnostic procedures & various outcome measures relevant to musculo-skeletal dysfunctions of the upper quadrant
5. Patho-biological mechanisms of pain; Recent advances in pain evaluation and management

6. Advances in the field of Manual Therapy
7. Principles of musculo-skeletal health and performance related fitness and Physiotherapeutic management of musculo-skeletal injuries & dysfunctions in various sports
8. Principles of assessment of industrial fitness and assessment & management of musculoskeletal dysfunctions related to various industries.
9. Ergonomics in Musculo-skeletal dysfunction of the upper quadrant.
10. Assistive technology used for stability and mobility to enhance function.
11. Therapeutic application of Yogasanas for musculoskeletal health and fitness (upper quadrant)
12. Evidence based practice to formulate effective assessment and treatment program
13. Evaluation of disability
14. Legislation and social care.
15. Assessment, clinical reasoning and management of Integumentary impairments due to musculoskeletal dysfunction
16. Pharmaco-therapeutics in musculoskeletal conditions and its relevance in physiotherapy
17. Clinical decisions for lower quadrant function in presence of upper quadrant dysfunction

### **Advances in Musculoskeletal Physiotherapy –(Part II)**

#### **(Musculo-skeletal Dysfunctions of the Lower Quadrant)**

#### **(Lower Quadrant includes lumbar spine, sacrum, pelvis and lower extremities)**

1. Anatomical, Physiological and biomechanical basis for assessment of movement dysfunctions of the lower quadrant
2. Pathophysiological and Pathomechanical basis for management of movement dysfunctions of the lower quadrant
3. Clinical decision making skills in evaluation & management of all pediatric, adult and geriatric dysfunctions of the lower quadrant
4. Advances in functional diagnostic procedures & various outcome measures relevant to musculo-skeletal dysfunctions of the lower quadrant
5. Patho-biological mechanisms of pain; Recent advances in pain evaluation and management
6. Advances in the field of Manual Therapy
7. Principles of musculo-skeletal health and performance related fitness and Physiotherapeutic management of musculo-skeletal injuries & dysfunctions in various sports
8. Principles of assessment of industrial fitness and assessment & management of musculoskeletal dysfunctions related to various industries.
9. Ergonomics in Musculo-skeletal dysfunction of the lower quadrant
10. Assistive technology used for stability and mobility to enhance function.

11. Therapeutic application of Yogasanas for musculoskeletal health and fitness (lowerquadrant)
12. Evidence based practice to formulate effective assessment and treatment program.
13. Evaluation of disability.
14. Legislation and social care.
15. Assessment and management of Integumentary impairments due to musculoskeletal dysfunction.
16. Clinical decisions for upper quadrant function in presence of lower quadrant dysfunction

### **Neuro Physiotherapy**

#### **Advances in Neurophysiotherapy - (Part I)**

1. Gross and fine motor development skills, posture and gait examination and functional performance.
2. Facilitation of development using appropriate skills in a neurologically disabled child.
3. Congenital and acquired disorders affecting growth and development of child.
4. Advanced skills in assessment of pediatric neuro-pathological, neuropsychological and neurosurgical conditions.
5. Advanced Physiotherapy approaches – Neuro-physiological principles, skills of handling in various approaches and rationale for effective management.
6. Clinical decision making and evidence based practice to formulate effective assessment and treatment program
7. Theories of motor control and learning, perceptuo-motor and sensory issues in children
8. Early identification of paediatric neurological disorders and early intervention skill.
9. Role of Physiotherapy in progressive paediatric neurological conditions, management of terminally ill child
10. Role of Physiotherapy in Neonatal intensive care units
11. Social integration of child in school and community – measures to ensure – attitudinal, environmental, manpower, assistive technology, legislation and support
12. Assessment, clinical reasoning and management, of Integumentary and other system impairments due to neuromusculoskeletal dysfunction.
13. Pharmaco-therapeutics in neurological conditions and its relevance in physiotherapy

#### **Advances in Neurophysiotherapy (Part II)**

1. Neurodevelopment and neurophysiological approaches in Adult neurological conditions
2. Advance skills in assessment of adult neuro-pathological, neuropsychological and neurosurgical conditions



3. Various outcome measures and assessment methods used in geriatric & adult neurological conditions
4. Clinical decision making and evidence based practice to formulate effective assessment and treatment program
5. Advanced Neuro-therapeutic skills for management
6. Role of Physiotherapy in progressive neurological conditions, management of terminally ill patient.
7. Facilitation and coping up with problems associated with ageing.
8. Prevention of age related complications  
Social integration in community – measures to ensure – attitudinal, environmental, manpower, assistive technology, legislation and support
9. Pharmacotherapeutics in neurological conditions and its relevance in physiotherapy

### **Cardiovascular and Respiratory Physiotherapy**

#### **Advances in Cardiovascular and Respiratory Physiotherapy (Part I).**

##### **(Respiratory Physiotherapy)**

1. Structural, functional and Biomechanical basis for assessment and management of dysfunctions of the respiratory system and thorax throughout the life span.
2. Clinical reasoning in physiotherapeutic evaluation & management of all neonatal, pediatric, adult and geriatric dysfunctions of the respiratory system and thorax in acute care and in rehabilitation
3. Advances in functional diagnostic procedures & various outcome measures relevant to assess intervention to dysfunctions of thorax and respiratory system.
4. Interpretation and application of Investigations related to Respiratory and thoracic dysfunction and its relevance to physiotherapy.
5. Evidence based practice in management of Respiratory & Thoracic impairments & dysfunction.
6. Pulmonary rehabilitation
7. Ergonomics and energy conservation in Respiratory dysfunction and use of assistive devices to enhance function and performance.
8. Pathology of pain in medical and Post-surgical conditions related to thoracorespiratory dysfunction and advances in its evaluation and management

9. Clinical decision making and evidence based practice in physiotherapeutic evaluation & management of all medical, surgical and traumatic disorders across the life span in a critical care(ICU) setting
10. Management of the critically ill: knowledge of Airways -types & management Mechanical ventilator, use of Oxygen therapy; Physiotherapeutic Interventions in intensive care, weaning andICU monitoring.
11. Postoperative respiratory care
12. Principles of health and performance, Risk stratification, Prevention and health promotion
13. Pharmacotherapeutics in respiratory condition and its relevance with physiotherapy

### **Advances in Cardiovascular and Respiratory Physiotherapy (Part II)**

#### **(Cardiovascular Physiotherapy)**

1. Structural and functional and Biomechanical basis for assessment and management of dysfunctions of the circulatory system including peripheral vessels and mediastinum throughoutthe life span.
2. Clinical decision making skills in physiotherapeutic evaluation & management of all neonatal, pediatric, adult and geriatric dysfunctions of the cardiovascular including peripheral Vasculature system and mediastinum in acute care and rehabilitation
3. Advances in functional diagnostic procedures & various outcome measures relevant to assess intervention to dysfunctions of cardiovascular and peripheral vascular system.
4. Evidence based practice in assessment and management of cardiovascular and peripheral vascular dysfunction and failure
5. Ergonomics and energy conservation in cardiovascular dysfunction and use of assistive devices to enhance function and performance.
6. Pathology of pain in medical and surgical impairments related to cardiovascular dysfunction and advances in its evaluation and management
7. Clinical decision-making skills in physiotherapeutic evaluation & management of all medical, surgical and traumatic conditions across the life span in a critical care (ICU) setting
8. Management of the critically ill: knowledge of Airways -types & management Mechanical ventilator, use of Oxygen therapy; Physiotherapeutic Interventions in intensive care, weaning andICU monitoring
9. Postoperative respiratory care
10. Cardiac Rehabilitation
11. Vascular rehabilitation
12. Principles of health and performance, Risk stratification, Prevention and health promotion, Metabolic and endocrinological disorders
13. Interpretation and application of Investigations related to Respiratory, cardiac and thoracic dysfunction and its relevance to physiotherapy.
14. Pharmacotherapeutics in cardiac condition and its relevance with physiotherapy.

15. Clinical decision-making skills in physiotherapeutic evaluation & management of Lifestyle disorders.
16. Cardio-Respiratory fitness testing and training in sports and diseases
17. Knowledge and skill of basic life support
18. Clinical reasoning, assessment and management of Integumentary and other system impairments due to cardiovascular and respiratory diseases

### **COMMUNITY PHYSIOTHERAPY**

#### **Advances in Community Physiotherapy –Part I (Essentials of Community Physiotherapy )**

1. Health and Illness; Levels of Healthcare & Fitness
2. Principles and practice of fitness training for health promotion in community
3. Basic Concepts of rehabilitation and foundations of rehabilitation
4. Institute based rehabilitation services and multi-disciplinary approach.
5. Methodology of CBR with reference to National Health Delivery system.
6. Role of National Institutes, District Rehabilitation Centre and Primary Health Centre (with appropriate exposure).
7. Public awareness to the various disabilities. Communications, Message generation and dissipation.
8. National and UN (United Nations) Legislations for persons with disability.
9. Disability detection and early intervention.
10. Appropriate Technology, Assistive devices used for Stability & Mobility to enhance function
11. Home exercise programs for various classifications of disabilities.
12. Physical fitness, stress management through yoga and psychosomatic approaches.
13. Principles and practice of Rehabilitation and outreach services including domiciliary services
14. Role of Government in CBR, inter-sectoral programs and co-ordination. Implementation of the Act.
15. Role of Non-Government organizations in CBR.
16. Community dynamics & scope of community physiotherapy.
17. Physiotherapist as a Master Trainer in CBR.
18. Role of Physiotherapist in disaster management

## **Advances in Community Physiotherapy – Part II (Women’s Health, Industrial Health and Geriatric Health)**

1. Evaluation and theories of aging; Assessment of the elderly;
2. Exercise prescription for the elderly; Psychosocial and safety issues in elderly
3. Geriatric Rehabilitation
4. Holistic physiotherapy for the aged.
5. Physiotherapy in maternal and child health care.
6. Women’s, Health: Women’s reproductive health and health care;
7. Exercise prescription in pre and post- natal stage;
8. Diagnosis and treatment of musculoskeletal pain and dysfunction during pregnancy
9. Diagnosis and treatment of musculoskeletal pain and dysfunction during post menopause.
10. Treatment of Incontinence and Pelvic floor dysfunction; Special problems related to women.
11. Occupational Health, Occupational Hazards, Industrial Hygiene, Vulnerable workers group and labor law;
12. Industrial therapy, Injury prevention and returning the worker to productivity
13. Ergonomics, Principles, Issues related to hand tools, posture, material handling and lifting
14. Prevention of work related Injuries and redesigning workspace, Designing auditory and visual displays for workers; Occupational stress; Environmental Pollution – noise, vibration etc.
15. Physiotherapy role in industry – preventive, intervention, ergonomic and rehabilitative.
16. Recent Advances in **Women’s Health, Industrial Health and Geriatric Health** in Community Physiotherapy.
17. Evidence Based Practice in Community Health.

## **Sports Physiotherapy**

### **Advances in Sports Physiotherapy – Part I**

- 1) Introduction to Sports sciences & exercise physiology
- 2) Terminology, methodology, rules, equipment, infrastructure of some common sports like Cricket, Football, Basketball, Tennis, Hockey, Track & Field, Aquatic Sports.
- 3) Body composition & analysis
- 4) Principles of Sports Biomechanics & Biomechanics of injury. Physics in sports: Biomechanics of Running, Throwing, Swimming, Jumping. Advances In Biomechanics assessment: 2D, 3D
- 5) Advanced Cardio Respiratory Exercise Physiology
- 6) Principles of Strength training
- 7) Fitness & strength testing in sports
- 8) Sports specific conditioning
- 9) Sports specific Agility training

- 10) Sports equipments (including Gym equipments)
- 11) Psychological aspects in Sports
- 12) Doping & performance enhancing drugs.
- 13) Protective equipments in Sports including Orthotics Sports Traumatology:
- 14) Introduction to Sports Medicine
- 15) Introduction to Sports Injuries
- 16) Principles of Tissue healing
- 17) Soft tissue injuries of Lower limb (Hip, thigh, Knee, leg, ankle, foot problems & injuries)
- 18) Soft tissue injuries of Upper limb (Shoulder, arm, elbow, forearm, wrist, hand problems & injuries)
- 19) Fractures & Dislocations
- 20) Spinal injuries
- 21) Head injury in sports
- 22) Overuse injuries in Sports
- 23) Specific issues in Females, pediatric & elderly athletes
- 24) On-field assessment & decision making
- 25) Injury prevention in sports
- 26) Pharmacotherapeutics and its relevance with physiotherapy

### **Advances in Sports Physiotherapy – Part II**

- 1) Principles of Sports Injury Management
- 2) Management of Sporting Emergencies including emergency procedures, advanced assessment skills, care & management
- 3) Initial management of Acute sports injuries
- 4) Pharmacological management of Sports injuries.
- 5) Fluid Balance & electrolyte disturbance correction
- 6) Overview of Surgical management (including Arthroscopic surgery) for Sports injuries.
- 7) Injury & Sports specific management
- 8) Management of overuse injuries in sports
- 9) Electrophysiological Agents in sports rehabilitation
- 10) Rehabilitation of Sports injuries
- 11) Manual Therapy Techniques in Sports Physiotherapy
- 12) Management of special population – paraplegic & physically challenged athletes
- 13) Sports medicine coverage during Sports events
- 14) Traveling with a Sports team as a Physiotherapist.
- 15) Musculoskeletal screening of Athletes – Pre season, In-season & Post –season

### Theory Examination

- 100 marks paper
- Two hours duration