SECTION – A

(Common for all candidates)

Total Marks: 50

Ph.D. Entrance Examination Syllabus (Research Methodology)

Unit	Content
1	**Basics of Research:** Research: Meaning, Objective, Characteristics, Steps of research, Methods of research, Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.
2	**Research Problem and Research Design:** Introduction to Research Problem, Necessity of Defining the Problem, Selecting the Problem, Techniques Involved in Defining a Problem, Meaning and Types of Research Design, Important Concepts Relating to Research Design
3	**Sampling Design:** Census and sample survey, Implications of a Sample Design, Steps in sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of sample Designs, How to Select a Random Sample?, Random Sample from an Infinite Universe, Complex Random Sampling Designs
4	**Data Collection and Analysis:** Methods of Data Collection- Observation, Interview, Questionnaires, Schedules, Survey and Experimental. Selection of Appropriate Method for Data Collection, Different Techniques of Sampling such as Probability and Non-Probability, Basic Statistical Methods of Data Analysis such as Frequency distribution, Measures of central tendency, Measures of Dispersion, Coefficient of variation, correlation and regression.
5	**Research Ethics and Morals:** Environmental impacts and Ethical issues, Commercialization, Copy right, Royalty, Intellectual property rights and Patent law, Plagiarism, Citation, Referencing style and acknowledgement.

SECTION – B

(Common for all candidates)

Total Marks: 50

Ph.D. Entrance Examination Syllabus (Physiotherapy)

ORTHOPEDIC AND SPORTS PHYSIOTHERAPY:

1. Applied anatomy with emphasis on Biomechanics & Kinesiology of Human motion and Work Physiology 2. Clinical assessment and rationale of Laboratory investigations along with differential diagnoses.3. Clinical Symptomatology, Pathophysiology and Patho-mechanics of musculoskeletal conditions 4. Physiotherapy management following fractures, dislocations and their complications, Amputations, cumulative trauma disorders and Burns. 5. Physiotherapy management in degenerative disorders and allied conditions. 6. Physiotherapy in post- operative management of metabolic, hormonal, neoplastic and infective conditions of bones and joints. 7. Physiotherapy following arthroplasty, implants and soft tissue repairs.8. Pre & post-operative physiotherapy in tendon transfer. Electrical stimulation and biofeedback procedures. 9. Kinetic and kinematics analysis for various functional activities. 10. Functional assessment (Hand function, Gait, Posture A.D.L; occupational work). 11. Hand Rehabilitation. 12. Assessment of locomotor impairments, disabilities and disability evaluation. 13. Physiotherapy management of locomotor disorder, principles of medical and surgical aspects, sports psychology and retraining. 14. Neurological complications of locomotor disorders. 15. Analysis and classification of sports and sports specific injuries and its management. 16. Management of sport injuries, sports fitness 17. Principles of Injury Prevention 18. Medico legal issues in sports, Sports Psychology, Sports Nutrition and Sports pharmacology. 19. Rehabilitation of paediatric musculoskeletal disorders. 20. Orthopaedic implants-designs, materials, indications, post-operative assessment and training. 21. External aids, appliances, adaptive self-help devices; prescription, biomechanical compatibility, check-out and training. 22. Manual therapy: soft tissue manipulations and mobilization, neural mobilization, acupressure.(Cyriax, Maitland, Butler, McKenzie, Kaltenborn, Mulligan) 23. Pilates- school of thought, Chiropractic school of thought, Osteopathi 24 25. Joint manipulation – peripheral joints and vertebral joints. 26. Neuromuscular Taping Techniques 27. Electro diagnosis: Electromyography and evoked potential studies. 28. Community based rehabilitation in musculoskeletal disorders. 29. Recent Advances in Musculoskeletal Disorders and Sports Physiotherapy.

NEURO-PHYSIOTHERAPY:

1. Anatomy and Physiology of Nervous System. 2. Normal sequential behavioral and Physiological changes throughout the developmental arc. 3. Neurophysiology of balance, coordination and locomotion. 4. Clinical symptomatology and Pathophysiology of the neurological disorders 5. Principles of clinical neuro diagnosis and investigation. 6. Various Evaluation Scales and Assessment methods used in neurological rehabilitation. 7. Electrodiagnosis: a. Neurophysiology of Nerve conduction studies and Electromyography. b. Instrumentation of Electrical stimulator, EMG, SFEMG, NCS (Nerve Conduction Studies). c. Electrical study of reflexes (H- reflex, Axon reflex, F- response, Blink reflex, Jaw jerk, Tonic Vibration Reflex). d. Repetitive nerve stimulation. e. Evoked potentials (SSEP, MEP, BAERA, and VER). f. Interpretation of neurophysiologic responses in Neuropathy, myopathy and neuromuscular disorders. 8. Evaluation of A.N.S dysfunction with

reference to psycho-physiological testing. Biofeedback training 9. Neuro-psychological functions. Perception testing and training.10. Theories of motor control and theories of motor learning, its application in physiotherapy. 11. Common facilitatory and inhibitory techniques. 12. Treatment approaches in neurological rehabilitation: Bobath, NDT, SI, Brunnstrom, Roods, PNF, Vojta, MRP, MFR 13. Musculoskeletal treatment concept applied to neurology: Adverse neural tissue tension tests in upper limb and lower limb. 14. Pathophysiology and Management of tonal abnormalities (Spasticity, Rigidity, Hypotonia, and Dystonia) 15. Medical and Physiotherapy management following Cerebrovascular accidents. 16. Traumatic Brain Injury. (ICU management, Coma stimulation, Restoration of motor control, Rehabilitation and community integration) 17. Traumatic spinal cord injuries. (ICU management, Coma stimulation, Restoration of motor control, Rehabilitation and community integration) 18. Physical therapy management of demyelinating, inflammatory, infectious, degenerative and metabolic diseases of the nervous system. 19. Physical therapy management of Motor neuron diseases, neuromuscular junction disorders, Brain tumor, and Neuro cutaneas disorders 20. Diseases of spinal cord, peripheral nerves and cranial nerves 21. Physiotherapy management for neuromuscular disorders. 22. Paediatric neurology (Cerebral Palsy, Developmental disorders, Neuropsychiatric disorders, Cerebral & Craniovertebral anomalies & metabolic disorders of nervous system). 23. Cognitive disorders and its rehabilitation. 24. Oromotor rehabilitation. 25. Vestibular disorders and its rehabilitation. 26. Bladder and Bowel dysfunction and its rehabilitation. 27. Assessment and management of various neurological gaits. 28. Rehabilitation following disorders of Special Senses, Speech. Language and Perception. 29. Associated functional disturbances of higher functions and their testing and training. 30. Application of Functional electrical stimulation and Bio- feedback in neurological rehabilitation. 31. Learning skills, A.D.L and functional activities.32. Aids and appliances in neurological disorders. Prescriptions, testing and training. 33. Basic knowledge of drugs used for neurological conditions. 34. Assessment of fitness and exercise prescription for special neurological population – Stroke, Paraplegia, TBI, Multiple Sclerosis, MND, Parkinsonism, & Ataxia. 35. Community based rehabilitation for neurological dysfunction.

CARDIO-RESPIRATORY PHYSIOTHERAPY:

1. Anatomy and physiology of cardio- vascular and respiratory systems. 2. Biomechanics of respiration. 3. Intrauterine development of cardiopulmonary system and difference between the adult and pediatric cardiopulmonary system. 4. Epidemiology, Symptomatology and pathophysiology of the cardio-respiratory disorders. 5. Clinical assessment, rationale of laboratory investigations and differential diagnosis, 6. Evaluation of respiratory dysfunctions, lung function tests – volumetric, analysis of blood gases, X-ray chest. 7. Evaluation cardiac dysfunction. [ECG, exercise ECG testing, Holter monitoring etc., Echocardiogram, X-Ray, Imaging techniques etc.] 8. Evaluation of peripheral vascular disorders: clinical, blood flow studies, temperature plethysmography. A.N.S dysfunction testing. 9. Risk factors and preventive measures in cardio respiratory conditions 10. Cardio-respiratory emergencies and management principles – medication, critical care, indications of surgical intervention, stabilization of vital functions defibrillation. 11. Intensive care unit – Concept and set-up, equipment for advanced methods of resuscitation, monitoring and patent management: artificial airways, ventilators, pulse –oxymetry etc 12. Oxygen therapy. 13. Cardio- pulmonary resuscitation. 14. Respiratory physiotherapy techniques – Techniques to improve lung volume; techniques to reduce the work of breathing and techniques to clear secretions. 15. Physiotherapy management for common conditions in the ICU 16. Poisoning, Drug overdose, and Drowning. 17. Physiotherapy management following

general Medical & Surgical conditions 18. Physiotherapy management of peripheral vascular disorders 19. Exercise testing, planning and prescription: aerobic and anaerobic exercise training. 20. Respiratory Pharmacology 21. Physiotherapy management in Obstructive and restrictive lung disorders 22. Pulmonary Rehabilitation 23. Physiotherapy management following congenital and acquired heart diseases 24. Cardiac rehabilitation - Conservative and post-operative management. 25. Physiotherapy modalities used for wound healing 26. Exercise Prescription for health promotion and fit.

COMMUNITY PHYSIOTHERAPY:

1. Health and Illness; Levels of Healthcare & Fitness
2. Basic Concepts of rehabilitation and foundations of rehabilitation 3. Institute based rehabilitation services and multi-disciplinary approach. 4. Methodology of CBR with reference to National Health Delivery system. 5. Role of National Institutes, District Rehabilitation Centre and Primary Health Centre (with appropriate exposure). 6. Public awareness to the various disabilities. Communications. Message generation and dissipation. 7. Persons with disability; Act – 1995 and related Government infrastructure.
8. Role of Government in CBR, inter-sectoral programs and co-ordination. Implementation of the Act. 9. Role of Non-Government organizations in CBR. 10. Scope of community physiotherapy. 11. Disability detection and early intervention. 12. Physical fitness, stress management through yoga and psychosomatic approaches. 13. Home exercise programs for various classifications of disabilities. 14. Physiotherapist as a Master Trainer in CBR. 15. Physiotherapy in maternal and child health care. 16. Evaluation and theories of aging; Assessment of the elderly; Exercise prescription for he elderly; Psychosocial and safety issues in elderly 17. Geriatric Rehabilitation 18. Holistic physiotherapy for the aged. 19. Occupational Health, Occupational Hazards, Industrial Hygiene, Vulnerable workers group and labor law; 20. Industrial therapy, Injury prevention and returning the worker to productivity 21. Ergonomics, Principles, Issues related to hand tools, posture, material handling and lifting 22. Prevention of work related Injuries and redesigning workspace, Designing auditory and visual displays for workers; Occupational stress; Environmental Pollution – nose, vibration etc. 23. Physiotherapy role in industry – preventive, intervention, ergonomic and rehabilitative. 24. Women's, Health: Women's reproductive health and health care; Exercise prescription in pre and post-natal stage; 25. Diagnosis and treatment of musculoskeletal pain and dysfunction during pregnancy and post menopause; 30 26. Treatment of Incontinence and Pelvic floor dysfunction; Special problems related to women. 27. Recent Advances in Community Physiotherapy.

PAEDIATRIC PHYSIOTHERAPY:

1. Normal motor development (development during Prenatal, Infancy, and child hood) 2. Reflex maturation. 3. Developmental assessment and diagnosis. 4. Developmental screening using various scales. 5. Genetic basis of pediatric disorders. Embryology & genetic counseling. 6. Cardio-respiratory assessment of neonate and infant and related pediatric disorder. 7. Principles of laboratory investigations for differential diagnosis. 8. Clinical symptomatology and patho-physiology of locomotor and cardiopulmonary disorders. 9. Growth and development of a child and its disorders 10. Maturational, Pathophysiological and recovery process in the CNS. 11. Assessment of progressive locomotor disorders – Neuropathic and Myopathic. 12. Early intervention- high risk babies, Neonatal care and management 13. Management of congenital locomotor disorders including the prosthetic and orthotic management. 14. Analysis of fitness and exercise prescription for special pediatric populations – cereral palsy, downs syndrome, polio, muscular dystrophy, juvenile diabetes and obesity. 15. Management of neuro pediatric patients. 16. Motor learning process – Theory and Techniques. 17. Disorders of perception and sensory integration. 18. Integrated approach in management of pediatric disorders. 19. Pediatric surgeries and its post-operative management. 20. Adaptive equipment for physically challenged children. 21. Physical therapy in public schools. 22. Sports and fitness in paediatrics. 23. CBR in pediatric conditions. 24. Recent Advances in Pediatric Physiotherapy