BIHAR UNIVERSITY OF HEALTH SCIENCES
MITHAPUR, PATNA– 800001

SYLLABUS
FOR
FIRST BACHELOR OF PHYSIOTHERAPY (B.Ph.T.)
EXAMINATION

Bihar University of Health Sciences. Patna
(Duration of Course $4^{1/2}$ Years including 6 months Internship)

First Bachelor of Physiotherapy (First B.Ph.T.)

Paper	Subject	Theory			Practical			Total	
		Marks	Hours	Min. Pass Marks	Marks	Hours	Min. Pass Marks	Marks	Hours
Paper I	Human Anatomy	100	3	50	100	3	50	200	6
Paper II	Human Physiology	100	3	50	100	3	50	200	6
Paper III	Bio-Chemistry & Bio-Physics	050	2	25	-	-	-	050	2
Paper IV	Bio- Mechanics & Kinesiology	100	3	50	100	3	50	200	6
Grand Total		**350**	**11**		**300**	**9**		**650**	**20**

Second Bachelor of Physiotherapy (Second B.Ph.T.)

Paper	Subject	Theory			Practical			Total	
		Marks	Hours	Min. Pass Marks	Marks	Hours	Min. Pass Marks	Marks	Hours
Paper I	Pharmacology	100	3	50	-	-	-	100	3
Paper II	Pathology & Bacteriology	050	2	25	-	-	-	050	2
Paper III	General & Social Psychology	050	2	25	-	-	-	050	2
Paper IV	Exercise Therapy - I	100	3	50	100	3	50	200	6
Paper V	Electrotherapy - I	100	3	50	100	3	50	200	6
Grand Total		**400**	**13**		**200**	**6**		**600**	**19**

Clinical Training:- 350 Hours

Third Bachelor of Physiotherapy (Third B.Ph.T.)

Paper	Subject	Theory			Practical			Total	
		Marks	Hours	Min. Pass Marks	Marks	Hours	Min. Pass Marks	Marks	Hours
Paper I	Medicine	100	3	50	50	$1^{1/2}$	25	150	$4^{1/2}$
Paper II	Surgery	100	3	50	50	$1^{1/2}$	25	150	$4^{1/2}$
Paper III	Psychiatry	050	2	25	-	-	-	050	2
Paper IV	Exercise Therapy- II	100	3	50	100	3	50	200	6
Paper V	Electrotherapy-II	100	3	50	100	3	50	200	6
Grand Total		**450**	**14**		**300**	**9**		**750**	**23**

Clinical Training:- 350 Hours

Final Bachelor of Physiotherapy (Final B.Ph.T.)

Paper	Subject	Theory			Practical			Total	
		Marks	Hours	Min. Pass Marks	Marks	Hours	Min. Pass Marks	Marks	Hours
Paper I	Physiotherapy in Medicine	100	3	50	100	3	50	200	6
Paper II	Physiotherapy in Surgery	100	3	50	100	3	50	200	6
Paper III	Rehabilitation & Therapeutic Management	100	3	50	-	-	-	100	3
Paper IV	Prosthetics & Orthotics	100	3	50	-	-	-	100	3
Paper V	Applied Mathematics & Statistics	050	2	25	-	-	-	050	2
Grand Total		450	14		200	6		650	20

Clinical Training:- 500 Hours.

Total Marks : 650 + 600 + 750 + 650 = 2650.

Total Teaching & Practical Hours : 1140 + 740 + 1420 + 1380 = 4680.

Total Clinical Training Hours : 350 + 350 + 500 = 1200.

Compulsory Internship Hours : 1150.

PAPER I

HUMAN ANATOMY

SECTION I : GENERAL & SYSTEMIC ANATOMY

1. **INTRODUCTION:**

   Scope of Anatomy, Cell as a structural and functional Unit, organization of tissue, organs and system; Anatomical position of the body.

2. **Skin and the appendages of the skin.**

3. **MUSCLES:**

   Voluntary and involuntary muscles, short description of the structure of different muscles.

4. **MUSCLES:**

   Classification of Voluntary Muscle, origin and Insertion Tendon; Isometric and isotonic contraction of the muscle.

5. **BONES:**

   Hard connective tissue, composition and Function, classification of bone according to Morphology and Development, various terms as ridge, tuberosity and trochanter.

6. **BONES:**

   Development of bones, Parts of long bones and blood supply of bones, central remarks about the bones of skull, thorax, vertebral column and extremities.

7. **JOINTS :**

   Definition, classification of joints, structure of Fibrous and cartilaginous joints.

8. **JOINTS:**

   Structures of synovial joint, Movements of joints, Blood supply of bone and joints.

9. **NERVOUS SYSTEM:**

   Nerve cell, Synapse and Reflex Arc.

10. **NERVOUS SYSTEM:**

    Organization of Central Nervous system, Spinal nerves and Nerve ending with demonstrations of various parts.

11. **CARDIOVASCULAR SYSTEM:**

Blood as a connective tissue, Functions in Short, Gross anatomy of Heart with demonstrations of various parts.

12. **CARDIOVASCULAR SYSTEM:**

Arteries, Veins, Capillaries, Collateral circulation, Nervous control of blood circulation, with demonstration and surface anatomy.

13. **RESPIRATORY SYSTEM:**

General outline of Respiratory Passages, Gross; anatomy of Lung Pleura; with demonstration of Surface anatomy.

14. **RESPIRATORY SYSTEM:**

Broncho–pulmonary segments, Intercostal Muscle and Mechanism of Respiration.

15. **DIGESTIVE SYSTEM:**

General idea or outline of Gastro–intestinal tract and associated glands; Demonstration of organs.

16. **EXCRETORY SYSTEM:**

Structure and function of kidneys, General outline of Ureters,Urinary Bladder and Urethra, demonstration of organs.

17. **REPRODUCTIVE SYSTEM:**

General outline of male and female genital organs; detail in female, brief in male.

18. **ENDOCRINES:**

Definition, structure in general, control of secretion of pituitary, thyroid, Adrenal, pancreas with demonstration.

19. **LYMPHATIC SYSTEM:**

Lymph circulation, Lymph nodes and Lymphoid tissue in details.

20. **GENERAL EMBRYOLOGY:**

(1) Female and Male Genital organs and development of ovum and sperm.
(2) Fertilization and formation of three germ layers and their dominations.
(3) Development of Bones, axial and appendicular skeleton and muscles.
(4) Neural tube, brains vesicles and spinal cord.
(5) Development of Brain and Brain stem structures.

DEMONSTRATIONS: Practical as per Syllabus.

(1) Muscles of; the whole body.
(2) Demonstration of organs in Thorax and abdomen.
(3) Demonstration of viscera of Head, Face and Neck.

(4) Demonstration of all the Glands in the body.

(5) Surface marking on living body of lung, pleura, fissures and Lobes of Lungs, Heart, Abdominal viscera.

(6) Identification of body prominences on inspection and palpation in the body especially of extremities. Points to palpate nerves and arteries, Identification of prominent muscles.

(7) Extra Ocular muscles and salient points about the eyeball.

(8) Ear – Specially the Internal Ear.

(9) Demonstration of Brain.

SECTION – II

MUSCULO-SKELETAL & NEURO-ANATOMY

1. **SUPERIOR EXTREMITY:**

Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals.

Soft Parts: Breast, Pectoral Region, Axilla, Front of Arm, Back of Arms, Cubital fossa, Front of Forearm, Back of forearm, Nerves and Vessels of Forearm, Palm, Dorsum of hand, Shoulder girdle, shoulder joint, Elbow Joint, Radio-Ulnar Joint, Wrist joint, Joints of hand.

2. **INFERIOR EXTREMITY:**

Osteology: Hip Bone, Femur, Tibia, Fibula and Patella, Tarsals Metatarsus.

Soft Parts: Front of thigh, Femoral triangle, Femoral canal & femoral hernia, Adductor Canal, Medial compartment of thigh, Gluteal region, Back of thigh, Popliteal Fossa, Anterior compartment of leg, Posterior compartments of leg, Sole of foot, Lymphatic drainage of leg, venous drainage of leg, hip joint, knee joint, Ankle joint, Tarsal joints.

3. **Trunk:**

Osteology: Cervical, Thoracic, Lumbar Vertebrae, Sacrum, Coccyx, and Ribs.

Soft tissue: Inter-vertebral joints, cost-vertebral joints, Inter-vertebral Disc, Ligaments and Muscles.

4. **THORACIC CAGE:** With muscles and Movements.

Head, Neck, Face region: Bones, Muscles, Nerves of face and neck, muscles.

Joints: Temporomandibular, Atlanto-occipital joint.

Dissection of Extremities and Demonstration of dissected: Parts of trunks; brain, thoracic and abdominal contents.

5. **NEURO-ANATOMY:** In details with applied and clinical aspect with demonstration of Brain and spinal cord.
    1. Sulci and Gyri and various areas of cerebral Hemispheres.
    2. Thalamus, Hypothalamus, Basal Ganglion
    3. Cerebellum
    4. Pons, Medulla
    5. Spinal Cord
    6. Ascending tracts
    7. Descending tracts
    8. Clinical application of knowledge of the tracts.
    9. Autonomic nervous system
    10. Nervous control of urinary bladder and bladder dysfunction
    11. Vestibule cochlear System
    12. Cranial nerves

PAPER II

HUMAN PHYSIOLOGY

(SECTION 1: GENERAL PHYSIOLOGY)

GENERAL PHYSIOLOGY:

1. Cell Structure and organelles.
2. General Principles of Biophysics.
3. Body Fluid Compartments.

BLOOD:

1. Composition of blood, Plasma Proteins formation and their function.
2. Structure, formation and function of R.B.C.
3. Structure formation and function of W.B.Cs and Platelets.
4. Coagulation and its defects, bleeding, clotting time.
5. Blood group and their significance, Rh. Factor.
6. Reticule Endothelial system. Jaundice, Structure and functions of Spleen,
7. Hemoglobin and E.S.R.

CARDIOVASCULAR SYSTEM:

1. Structure, properties of Heart muscle and nerve supply of Heart, Structure and function of arteries, Capillaries and veins.
2. Cardiac cycle and heart sounds.
3. Cardiac output, measurement, factors affecting.
4. Heart rate and its regulation, cardio vascular reflexes.
5. Blood pressure, its regulations and Physiological Variations.
6. Peripheral resistance, factors controlling role in B.P.
7. Hemorrhage.
8. E.C.G.
9. Changes in muscular exercise.

RESPIRATORY SYSTEM:

1. Mechanism of respiration. Intra-pleural and Intra-pulmonary pressure.
2. Lung volumes and capacities.
3. O_2 and Co_2 carriage and their exchange in tissues & lungs.
4. Nervous chemical regulation of respiration – Respiratory centers.
5. Respiratory states– Anoxia, Asphyxia, cyanosis, Acclimatization.

DIGESTIVE SYSTEM:

1. General outline and salivary digestion.
2. Gastric secretion & its mechanism of secretion & functions.
3. Mechanism of secretion of Succus entericus and pancreatic juice and its functions.
4. Structures and Secretions and functions of liver.
5. Digestion, absorption and Metabolism of carbohydrates.
6. Digestion, absorption and metabolism of Fats.
7. Digestion, absorption and metabolism of proteins.
8. Vitamins, sources functions and requirements.
9. Balanced diet in different age groups and occupation.

ENDOCRINES:

1. Anterior Pituitary.
2. Post Pituitary and Parathyroid.
3. Thyroid
4. Adrenal cortex.
5. Adrenal Medulla, Thymus.
6. Pancreas and Blood sugar regulation.

REPRODUCTION SYSTEM:

1. Sex determination and development, puberty.
2. Male sex hormones and their functions, spermatogenesis.
3. Female sex hormones and functions, Menstrual cycle, Ovulation and contraceptives.
4. Pregnancy, functions of placenta and lactation.

EXCRETORY SYSTEM:

1. Gross and minute structure of kidney and features of Renal circulation.
2. Mechanism of Formation of urine, GFR and Tubular function.
3. Renal function Tests.
4. Physiology of micturition.

SECTION – II

(NEURO-MUSCULAR PHYSIOLOGY)

MUSCLE AND NERVE:

1. Structure of neurons, membrane potential and generation of action potential.
2. Nerve impulse Neuro Muscular conduction, saltatory conduction.

3. Nerve muscular junction and drugs acting on it, Myasthenia gravis.
4. Degeneration and regeneration of peripheral Nerves, reaction of degeneration, Wallerian degeneration, Electro tonus and Pflueger's law.
5. Types of Muscle, Microscope structure of Muscle, Properties of muscle, comparison of various types of muscle.
6. Sarcomere, Mechanism of muscular contraction.
7. Thermal and chemical changes during muscular contraction.
8. Starling's law, Isotonic, Isometric contractions, chronaxie, Rheobase.
9. Action potential.
10. Motor Units and its properties, clonus, tetanus, Fatigue, summation, All or none law, Beneficial effect.
11. Electromyography, applied aspects.
12. Nerve fibers classification, spread or impulse.
13. Velocity of nerve conduction, factors affecting velocity.

NERVOUS SYSTEM:

1. Types and properties of receptors, types of sensations.
2. Structure of synapse, Reflex arc and its properties, occlusion summation, subliminal fringe etc.
3. Sensory tracts of spinal cord.
4. Motor tracts, Pyramidal and Extra pyramidal.
5. Hemi section and complete section of Sp. Cord, upper and lower motor neuron paralysis.
6. Cerebral cortex, areas and functions E.E.G.
7. Structure, connections and functions of cerebellum and Hypothalamus.
8. Basal ganglia and thalamus, connections and functions.
9. Reticular formation tone, posture and vestibular apparatus.
10. Autonomic Nervous system.

SPECIAL SENSES:

1. Broad feature of eye, errors of refraction, lesions of visual pathways.
2. Speech and its disorders.
3. Ear and Vestibular apparatus.

PRACTICALS AND DEMONSTRATIONS:

A. 1. Haemoglobinometer and total R.B.C. count.
2. Total W.B.C. count.

3. Preparation and staining of blood smears, Determination of differential W.B.C. count.
4. Blood grouping.
5. Erythrocyte Sedimentation Rate
6. Bleeding and clotting time.

B. 1. Artificial respiration.
2. Pulmonary function tests.

HUMAN PHYSIOLOGY EXPERIMENTS:

C.1. Heart sounds, Radial Pulse, Tracing, Basal Metabolic Rate.
2. Arterial Blood pressure in man.
3. Cardiac efficiency tests.
4. Recording and study of Electrocardiogram.

D.1. Testing of peripheral sensations and cranial nerves.
2. Superficial and deep reflexes.
3. Study of special senses.

ANIMAL PHYSIOLOGY EXPERIMENTS

PRACTICAL

E. 1. Electrical Reactions & Electro-diagnostic test.
2. Varieties of stimuli, Electrical Apparatus for Physiological Eperiments.
3. Frog's Nerve-muscle preparation and demonstration of the following experiments on it.
4. Electromyography – Principle & application.
5. Simple muscle twitch.
6. Effect of load, Temperature and fatigue of Muscular Contractions.
7. Frog's normal cardiogram.

Effect of following on normal cardiogram of Frog:

- Temperature.
- Extra systole.
- Stimulation of vagal sympathetic trunk.
- Stannius ligature.
- Radial pulse tracing.
- Basal Metabolic rate.
- Work Physiology.

Physiological effect of Electrical stimulation & use of High frequency current and various heat therapy agents.

PAPER III
BIOCHEMISTRY AND BIOPHYSICS

BIOCHEMISTRY:

1. Biochemical characteristics of living matter.
2. Biochemistry morphology of cells physiology.
3. Nucleic acids.
4. Proteins.
5. The enzymes.
6. Metabolism-carbohydrates, lipids, proteins, vitamins.
7. Hormones.
8. Nutrition
9. Biochemistry of connective tissues, nerve tissue and muscles.
10. Water, electrolyte and acid base balance.
11. Chemistry of biological Materials-Blood, C.S.F., Milk.
12. Physio-chemistry phenomenon.
13. Common procedure used in biochemistry.
14. Laws of solutions : Diffusion and osmotic pressure; Permeability of membrane, colloids; surface tension; Absorption; Hydrogenation, concentration; enzymes. Digestion and absorption.
15. Chemistry of lipids; including sterols and phospholipids; chemistry of carbohydrates, Proteins; Nucleoproteins; Blood and lymph, hemoglobin and its derivatives, biles; urine; urinary deposite, faeces etc.

BIOPHYSICS:

1. Molecular Biophysics, Structure thermodynamics.
2. Electro-chemistry.
3. Micro-bio, including electro microscopy, spectroscopy, configurations, chromatography, electro phoresies, tracer technique.
4. Cell biophysics.
5. Computers.
6. Reduction biology.

PAPER IV
BIOMECHANICS & KINESIOLOGY

COURSE DESCRIPTION: This subject is intended to provide assistance to the student to acquire adequate Knowledge in basic mechanics and human biomechanics and to be able to understand the kinetics and kinematics during various activities.

COURSE OBJECTIVES: At the end of the course the student should be able to understand:

- The principle of biomechanics and their application in health and disease
- The movement analysis and muscle work involving various joints of the body
- The normal and abnormal posture and gait

SECTION –I: MECHANICS

a) Introduction to mechanics including motion, forces, parallel forces system.

b) Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.

c) Centre of Gravity, line of gravity, stability and equilibrium.

d) Introduction of Bio-Mechanics and terminology.

SECTION- II: JOINT STRUCTURE AND FUNCTION

a) Basic principles of Joint design and a human joint.

b) Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.

c) Classification of joints.

d) Joint function, Kinematics chains and range of motion.

e) Recall anatomy and study the biomechanics of the spine, shoulder girdle, Joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

SECTION – III: MUSCLE STRUCTURE AND FUNCTION

a) Mobility and stability, functions of muscle.

b) Elements of muscle structure and its Properties.

c) Types of muscles contraction and muscle work.

d) Classification of muscles and their functions.

e) Group action of muscles, Co-ordinated movement.

SECTION IV : BIOMECHANICS OF JOINT COMPLEXES

Biomechanics of Vertebral Column: General structure and Function (region wise). Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle, General effects of Aging and Injury.

1. Biomechanics of shoulder complex: Components of shoulder complex, Integrated Function of Dysfunctions around Shoulder Complex.
2. Biomechanics of Elbow Complex: Structure and function of the Elbow Complex. Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex.Effect of Immobilization and Injury.
3. Biomechanics of the Wrist and Hand Complex: Structural components of the wrist complex. Function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand.
4. Biomechanics of Temporomandibular Joint.
5. Biomechanics of the Hip Complex: Structure and Function of the Hip Joint. Arthrokinematics and Osteokinematics. Hip Joint Musculature, stability, Muscle Function in Bilateral and single leg stance, Trabecular System, Biomechanical alteration in various Hip joint Pathology.
6. Biomechanics of the Knee Complex: Structure and Functuion of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella, Biomechanics changes in the Knee complex with Pathology.
7. Biomechanics of the Ankle Complex: Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot. Effect of weight bearing on foot.

SECTION- V: POSTURE AND GAIT

a) Posture Definition, factors responsible for posture, relationship of gravity on posture.

b) Postural imbalance – factors responsible for imbalance in Static and dynamic positions including ergonomics.

c) Description of Normal gait. Determinants of gait. Spatio temporal features and analysis.

d) Gait deviations – Types, Causative factors and analysis.

SECTION- VI : ERGONOMICS

a) Definition, Principles, evaluation and management- engineering, administrative and personal protective devices.

b) Mechanical hazards-overuse\fatigue injuries due to ergonomic alteration & ergonomic evaluation of workplace-mechanical stresses per hierarchy –

i. sedentary table work executives. Clerk,

ii. Inappropriate seating arrangement- vehicle drivers.

iii. Constant standing- watchman- Defense forces surgeons.

iv. Over-exertion in laborers-common accidents – Role of P.T.- Stress management.

BIOMECHANICS & KINESIOLOGY (PRACTICAL)

1. To study the effects of forces on objects.
2. To find out the C.O.G. of an object.
3. To identify axis and planes of motion at the joints of spine, shoulder, girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.
4. To study the different types of muscle contraction, muscle work, group action of muscles of coordinated movements.
5. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in Antro-posterior and lateral views.
6. Analysis of normal gait and measurement of spatio temporal features.

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SYLLABUS
FOR
SECOND BACHELOR OF PHYSIOTHERAPY (B.Ph.T.)
EXAMINATION

PAPER I

PHARMOCOLOGY

1. General Pharmacology
2. Detail study of Pharmacology.
3. Drug allergy and idiosyncrasy.
4. Drug Toxicity.
5. Metabolic fate of drug.
6. Method of administration of drugs.
7. Chemical characters of drugs.
8. Drugs acting on Central Nervous System- Anesthetics, Alcohols, Alkaloids, Narcotics, Antipyretics, Hypnotics, Sedatives, Anti-convulsants, Stimulants, Psychotherapeutics. Drugs acting on Autonomic Nervous systems. Drug acting on pain & inflammatory conditions.
9. Drugs acting on peripheral nervous system- Stimulating and/or inhibiting cholinergic and adrenergic activity.
10. Drugs acting on Neuromuscular junction and muscles; pupil, ciliary movement; skin etc.
11. Drugs acting on respiratory system, gastro intestinal system, kidney and uterus.
12. Drugs acting on cardio vascular system; blood & blood forming tissues, Blood vessels.
13. Chemotherapeutic agents, General anesthetics, study of effect of local and general anesthetic on eye and skin etc. and other physiological systems.
14. Hormones and drugs affecting endocrine functions.
15. Vitamins; Antibiotic; Sulpha drugs.
16. Metabolic and other inorganic compounds.
17. Immunological products / agents.
18. Diagnostic agents.
19. Study of clinical Pharmacology and Pharmacotherapeutics. Mode of actions of drugs; Pharmacological Principle of Medical Practice.
20. The chemical and Physical basis of Pharmacology.
21. Manifestations of Pharmacological actions.
22. Classification of drugs according to selective actions, General action of drugs.
23. Definition of pharmacological terms.
24. Conditions influencing absorption and excretion of drugs.

25. Conditions influencing action of drugs e.g. allergy and idiosyncrasy; anaphylaxis, tolerance and cumulative action etc.
26. Action of sera and Vaccination.
27. Action of drugs on Mental conditions.
28. Detail study of Pharmacotherapeutics and clinical Pharmacology.
29. Pharmacodynamics- Principle of Drug Action, mechanism of Drug Action, Drug Dosage; factors modifying Drug action. Instruction in experimental pharmacodynamics, study of pharmacokinetic aspects.
30. Adverse Drug effects: Side effect, Secondary effects, toxic effects, Poisoning, Intolerance, Idiosyncrasy, Drug Allergy, Photo sensitivity: Drug dependence, Drug abuse (Addition); Drug withdrawal reactions, Drug induced diseases.

    Mechanism and types of Drug reaction:
31. Introduction of forensic Medicines and Toxicology; and Medico-legal aspect.
32. Chemotherapy.
33. Method of prescribing and treatment for common diseases or illness or any associated clinical problems of existing earlier or arising during or after the process of Therapeutic System of Physiotherapy and Occupational Therapy, with the use of modern scientific drugs / Medicine.
34. Principle Practice of Western Medical Science and Modern Scientific system of Medicine; its application in various clinical conditions.
35. Study of Pharmacology including Modern Medical and Pharmacological Chemistry and applied Pharmacology and therapeutics elaborating the rational basis of medical treatment of disease and illness and various clinical conditions use of drugs.

PAPER II
PATHOLOGY AND BACTERIOLOGY

1. Aims and objects of study of Pathology, Meaning of the terms etiology, Pathogenesis, lesions and disease.
2. Various causes of disease and an approach to laboratory study and diagnosis of process of disease.
3. Brief outline of sick cells, degenerations, necrosis, gangrene etc.
4. Inflammation: Definition, Vascular and cellular Phenomenon, tissue changes, exudate and pus formation, Difference between acute and chronic inflammation.
5. Repair (bone, skin, nerves and muscles etc).
6. Circulatory disturbances with emphasis on ischemia, thrombosis, embolism, infarction. Diseases of cardio vascular system.
7. General approach to bacterial and viral infections, Emphasis on tuberculosis, syphilis, leprosy, fungal infections.
8. General approach to immunity and allergy.
9. Neoplasia, Benign and malignant, spread of tumors.
10. Diseases of nervous system, joints, bones and muscles.
11. Brief outline of blood disorders and parasitic infection.
12. Animal Parasites.
13. Deficiency diseases, pigments and pigmentation.
14. Physical irritants and chemical poisons.
15. Ionizing Radiations.
16. Medical Genetics.
17. Regional Pathology of heart, blood vessels, female reproduction system, Nervous system, the bones, the joints, the muscles, the skin etc.
18. Diseases of respiratory system and genitourinary systems.

No Practical.

PAPER III
GENERAL AND SOCIAL PSYCHOLOGY

(A) GENERAL PSYCHOLOGY

1. (i) NATURE OF PSYCHOLOGY: Behavior and Experiences; Conscious, sub-conscious and Unconscious mind.
   (ii) FIELDS OF PSYCHOLOGY: Introspective and Experimental Methods.
   (iii) SCHOOLS OF PSYCHOLOGY: Associationism; Psychoanalytical theory, Behaviorism; Gestalt Psychology; Structuralism and Functionalism.
2. Heredity (Chromosome Theory); Environment – Physical, Psychological and Social Environment.
3. Motivation – Principle of Homeostasis; Need and its relation to structure and Environment. Kinds of Motives – Physiological, Psychological, Social and Unconscious Motives; Life goals and levels of Aspirations Interests and attitudes as motivational forces.
4. Emotion–Its nature and relationship with Autonomic Nervous System; James-Lange theory of Emotion; Mc Dougall's theory of Emotion; sentiments and feelings; Pathological and Functional disorders of Emotions; Emotional Hygiene.
5. Conflict and frustration; common defensive mechanisms – Identification, Regression, Repression, Projection, sublimation and Rationalization.
6. Learning – Role of Learning in Human Life; Types of Learning
   (a) Thorndike's Trial and Error Learning.
   (b) Associative (conditioning) Learning, Practical application of conditioning technique as in morbid fears, compulsion to steal and other neurotic behavior in eliminating undesirable behavior.
   (c) Learning by insight- Gestalt learning, Kolber's experiments on animal learning; Transfer of Learning.
7. Memory (Retention) Types of memory – Recall, Recognition and Rose memory, Causes of forgetting; Retroactive inhibition, Disorders of memory- Amnesia, Paramnesia, Hyper amnesia.
8. Attention and Perception – Nature of attention, Factors determining attention; Nature of perception, principles of perceptual grouping, Illusions and Hallucinations.
9. Intelligence – Definition, Intelligence tests – their uses; How the Test is standardized; Intelligence Quotient (I.Q) General intelligence and special intelligence.

10. Personality– Definition; Types approach and Trait approach, Measurement of personality – Interview, Questionnaire Rating, Performance, Projective methods, Factors contributing towards development of personalities – Biological and Social factors.

(B) SOCIAL PSYCHOLOGY

1. Nature and scope of Social Psychology.
2. Social Interaction – Primary and Social Stimulation.
3. Psychological groups and their classification.
4. Socialization of the Individual.
5. Social Control (Social Heredity) – Morals, Costumes. Fashions; Propaganda, its technique.
6. Leadership (Personal Social Control) – Functions, Role and Qualities of a Leader.
7. Personality – Culture and Personality.
8. Attitudes and prejudices – Classification of Attitudes; Evils and causes of prejudices. How to change Attitudes and prejudices.
9. Crowds and Public Opinion.
10. Social change and Progress.

PAPER IV

EXERCISE THERAPY- I

Students should have basic knowledge of assessment and evaluation of the pattern for selecting the techniques and methods for maximum functional restoration including indications and contra-indications.

1. **Analysis Of Joint Movement And Muscle Action:**
   (i) Normal Joint Range and variations within normal limits.
   (ii) Muscle action – agonist, antagonist, fixator, synergist.
   (iii) Isotonic and Isometric contractions.
   (iv) Group Action of muscles.

2. **Analysis Of Movements:**
   (i) Fundamental Positions and their uses-lying, sitting, standing, kneeling and hanging.
   (ii) Derived positions of moving limbs, back, trunk and head.
   (iii) Analysis of pattern of movement including rolling, lying to sitting, sitting to standing, walking.
   (iv) Developmental sequence of movement from baby to adult.

3. **Classifications, definitions and effects of passive, assisted active and resisted movements.**

4. **Maintenance And Restoration Of Range Of Movement (ROM) And Joint Stability: -**
   Mobilizing and strengthening techniques to achieve Optimum function depending upon-cause of limitation which might involve:
   (i) Particular change methods of strengthening muscle to maintain existing range and improve function.
   (ii) Peri-articular change, joint swelling, muscle tension, muscle weakness, muscle spasm, adhesions or scars, appropriate methods to reduce swelling, reduce hypertonicity, strengthen muscle and reduce scars.

5. **Strengthening Muscle And Increasing Endurance:**
   (i) Assisted active exercises, exercise in suspension and in water.
   (ii) Free active exercise- involving use of gravity, friction and levers.

(iii) Resisted exercises- Manual – slow reversal, holding though range, repeated contractions etc. Mechanical – progressive resistance exercises (PRE) , using weights, springs and pulleys. Body weight.

(iv) Endurance – high repetition, low resistance exercises.

(v) Exercises for Strengthening – High resistance and low repetition.

6. **Relaxation:**

(i) Mental and Physical-tension.

(ii) Local and general Physical tension.

(iii) Methods of teaching relaxation.

(iv) Shavasan (Still Pose).

7. **Testing Procedures:**

(i) Range of Movement.

(ii) Manual examination of joint movement and tissue resistance and Muscle Power.

8. **Suspension Therapy** :- Introduction, Principles, Types, Techniques Of Applications, Precautions, Effects & Uses.

9. **Introduction Of Therapeutic Gymnasium Modalities**:- Shoulder Wheel, Overhead Pulley, Finger Ladder, Parallel Bar, Postural Mirror, Couch / Plinth, Tilt Table, Wrist Roller, Intrinsic Hand Exerciser, Ankle Exerciser, Quadriceps Chair, Static Cycle, Treadmill, Physio Ball, Medicine Ball, Thera-Bands, Corner Stairs, Therapeutic Mats, Weight Cuffs / Sand Bags, Continuous Passive Motion Machine Etc.

EXERCISE THERAPY -I (PRACTICAL)

1. To study the different types of muscle contraction, muscle work & group action of muscles.
2. To study the position of joints, muscle work & stability of various fundamental & derived positions.
3. To study & practice different types of movements & its subtypes.
4. To study & practice various techniques of progressive resistance exercises (PRE) of muscles - region wise.

5. To study & practice local & general relaxation techniques.
6. To practice the measurement of ROM of joints - head, upper limb, lower limb & trunk.
7. To practice the grading of muscle strength of head, upper limb, lower limb & trunk.
8. To practice the various types of suspension therapy & its application on various parts of body - region wise.
9. To study the structure & function along with application of various equipments in a therapeutic gymnasium.

PAPER V
ELECTROTHERAPY- I

SECTION – I

MEDICAL ELECTRONICS & LOW AND MEDIUM FREQUENCY CURRENTS

I. Basic Principles:-

1. Structure and properties of matter-solids, liquids gases-cohesion, adhesion, surface tension, viscosity, density and elasticity.
2. Structure of atom, molecules, elements and compounds.
3. Electron theory, static and current electricity.
4. Conductors, Insulators, Potential, Resistance, Intensity.
5. Ohm's Law.

II. Rectifying Devices:- Thermionic Valves, Semiconductors, Transistors, Amplifiers and Oscillation circuits.

Capacitance, condensers in D.C. and A.C. Circuits.

III. Effect Of Current Electricity:-

1. Chemical effects-ions and electrolytes, ionization, Production of an E.M.F. by chemical actions.
2. Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electro-magnetic Induction.

   Mill ammeter and Voltmeter, Transformers & Choke Coil.
3. Thermal Effects-Joule's Law and Heat Production.

IV. Low Frequency Current:-

1. Direct and A.C. currents.
2. Production of Direct Current: Physiological and therapeutic effects of constant current Anodal and cathodal galvanism, lionization and their application in various conditions.
3. Modified direct current various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of Interrupted and surged direct current circuit diagram and principles of working.

4. Physiological and therapeutic effects- their application and techniques in various conditions.
5. **Transcutaneous Electrical Nerve Stimulation (TENS):-** definition, types, frequencies, parameters used in TENS applications, electrode placement, theories of pain relief by TENS. Methods of application, therapeutic effects, indications, contraindications, precautions & dangers. Iontophoresis.

V. **Main supply:-** Brief outline of mains distribution, Dangers-short circuits precautions-Safety devices, earthing, fuses etc.

VI. **Electrical Reactions And Electro-Diagnostic Tests:-**

1. Electrical Stimulation and normal behavior of Nerve and muscle tissue to these stimuli.
2. Types of lesions and development of reaction of degeneration
3. Faradic-I.D.C. Test
4. Nerve conduction Test.
5. S.D. Curve and its interpretation.
6. Pulse Ratio
7. Chronaxie, Rheobase, Myasthenia and Myotonic reactions.
8. Elements of E.M.G.
9. T.N.S.

VII. **Medium Frequency Currents:- Inter-Ferential Therapy (IFT)**

Introduction, Physical Principles Of IFT, Treatment Parameters:- Amplitude Modulation Ferequency (AMF) Frequency Sweep. Methods Of Electrode Placement:-Biploar (Exogenous) & Quadripolar (Endogenous). Mode:- Vector/Scanning. Types Of Electrodes, Intensity Of Current, Duration Of Current. Physiological Effects, Therapeutic Effects, Indications, Contraindications, Techniques Of Application, Precautions & Procedure Of Treatment.

SECTION - II

I. SUPERCIFICAL THERAPEUTIC HEATING MODALITIES:-

(i) **Paraffin Wax Bath**: Components & Preparations, Methods Of Applications, Physiological & Therapeutic Effects, Indications, Contraindications, Precautions, Operational Skills Of Equipment & Patient Preparations.

(ii) **Moist Heat**: Introduction, Methods Of Application, Physiological & Therapeutic Effects, Indications, Contraindications, Precautions, Operational Skills Of Equipment & Patient Preparations.

(iii) **Contrast Bath**: Introduction, Principles, Therapeutic Temperature Of Hot & Cold Water, Physiological & Therapeutic Effects, Indications, Contraindications, Precautions, Methods Of Application.

(iv) **Electrical Heating Pads**: Introduction, Advantages & Disadvantages, Treatment Procedure, Potential Dangers, Indications & Contraindications.

(v) **Whirlpool Bath**: Introduction, Types, Techniques Of Application, Advantages & Disadvantages.

(vi) **Fluidotherapy**: Introduction, Techniques Of Application, Advantages & Disadvantages.

II. Cryotherapy:-

Introduction, Principles, , Methods Of Application, Physiological & Therapeutic Effects, Indications, Contraindications, Precautions & Dangers.

Evaporating Sprays, Cryokinetics, Cryostretch.

III. Biofeedback:-

Introduction, Principles, Instrumentation, Therapeutic Effects, Clinical Significance Indications Contraindications, Limitations & Precautions.

ELECTRO THERAPY -I (PRACTICAL)

1. To study the basic operation of electric supply to the equipment & safety devices.
2. To experience Sensory and motor stimulation of nerves and Muscles by various types of low frequency currents on self.

3. To locate and stimulate different motor points region wise.
4. Therapeutic application of different low frequency currents TENS, Faradic Foot Bath, Faradism under Pressure, stimulation of pelvic floor muscles, ionotophoresis, anodal and cathodal galvanism.
5. To study the Reaction of Degeneration of nerves. To plot strength duration curves. To find Chronaxie and Rheobase.
6. To study an electric vibrator, its operation and application – region wise.
7. To study a Interential Therapy, its operation and application – region wise.
8. To study a Paraffin Wax Bath Unit, its operation and different methods of application – region wise.
9. To study a Hydro-collator unit, its operation & therapeutic application of Hot Pack-region wise.
10. To study a Contrast Bath Unit, its operation & therapeutic application of Contrast bath.
11. To study a Cryo-therapy unit, its operation and application of cold packs-region wise.

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SYLLABUS
FOR
THIRD BACHELOR OF PHYSIOTHERAPY (B.Ph.T.)
EXAMINATION

PAPER I

MEDICINE

SECTION – 1 : GENERAL MEDICINE

1. **Diseases Of Cardio-Vascular System:** Ischemic Heart Disease, Hypertensive Heart Disease, Rheumatic Heart Disease, Congenital Heart Disease, Hypertrophic heart disease, Syphilitic heart disease, vascular disease, Thrombosis, Embolism.
2. **Rheumatic Disease:** Rheumatoid arthritis, Rheumatic Fever, Still's Disease, Collagen disease.
3. **Diseases Of Endocrine System:** Emphasis on diabetes Mellitus and outline of Hypopituitarism, Goitre, Hyperthyroidism & Hypothyroidism.
4. **Disease Of Respiratory System:**
   (a) Disease of lung, Bronchitis, Bronchial Asthma, Bronchiectasis, Pulmonary embolism, Pulmonary Tuberculosis, Lung Abscess, Emphysema
   (b) Disease of Pleura- Pleurisy, Empyema.
5. **Diseases Of Digestive System:** Gastric and Duodenal Ulcers, Hematemesis.
6. **Deficiency Disease:** Rickets, Protein deficiency.
7. Leprosy, Elementary Knowledge of skin and venereal diseases and Infectious diseases.
8. Study of other medical conditions.
9. **Dermatology:**
   (i) Characteristics of normal skin.
   (ii) Abnormal changes.
   (iii) Types of skin lesions.
   (iv) **Conditions:** Leprosy, Acne, Boil, Carbuncles, Impetigo, Parasitic Infections of skin, Herpes, Urticarial, Pityriasis, Skin Disorders, Associated with circulatory disturbances, Water Born, defects in pigmentation, psoriasis, Leucoderma, Fungal Infections, Alopecia, Dermatitis, Eczema, skin allergies, venereal disease, Syphilis etc.
10. Brief Study of Preventive & Social Medicine
11. Excretory Diseases – Renal failure, Glomerulonephritis, Renal Bone Disease.

SECTION –II: NEUROLOGY

1. General principles of Neurological Diagnosis.
2. Vascular Disorders of Brain.

3. Space occupying lesions within the skull Tumors, Hematomas and Abscess.
4. Acute Infections of Nervous system: Encephalopathy, Meningitis, Poliomyelitis.
5. Common Infections of Peripheral, spinal and cranial Nerves.
6. Injuries of brain and spinal cord.
7. Vertebral disc lesions and low back pain.
8. Cerebral Palsy, Hydrocephalus, Spina bifida & Myopathies.
9. Introduction to degenerative Neurological conditions: Syringomyelia, Parkinsons, Disease, sub-acute combined degeneration of cord, Disseminated Sclerosis; Lateral Sclerosis.
10. Functional Neurology.
11. Study of other Neurological conditions.

Practical – As per Syllabus.

PAPER II

SURGERY

SECTION – 1: GENERAL SURGERY

1. Description of events Frequently accompanying surgery in General Anesthesia, Blood Transfusion and Physiological response of the body to surgery.
2. **Common Pre And Post-Operative Complications**– Clinical picture, treatment and prevention.
3. **Wounds, Sinuses And Ulcer:** Incisions, healing and principles of treatment.
4. **Major Abdominal Surgery:** Management and complications.
5. **Thoracic And Cardiac Surgery:** Thoracotomy, Tubectomy, Pneumonectomy, Thoracoplasty, Mitral Volvotomy.
6. **Neuro–Surgery–** Surgery of peripheral Nerves and outline of cranial and spinal cord Surgery.
7. **Plastic Surgery**: Principles of cineplasty, tendon transplant, Cosmetic surgery. Types of grafts, Surgery of hands with emphasis on management of traumatic and leprosy hand.
8. **Burns:** Classification, early and late complication and management and reconstructive surgery.
9. **Ophthalmology:** Errors of refraction, Conjunctivitis, Trachoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, glaucoma, ptosis, defects of External Rectus and Hysterical blindness.
10. **E.N.T.:** Sinusitis, Rhinitis, Otitis media, Otosclerosis, Functional amphonia and deafness.
11. **Obstetrics And Gynecology:** Review of the system, Pregnancy, labour; common complications and their treatment, common Gynecological disorders and their management.

SECTION – II
ORTHOPAEDICS

1. **Fractures, Dislocations And Soft Tissue Injuries :**

   (a) Pathology of Fractures and Repair of bones, reasons for Union, Non-union, delayed union, fibrous union, excess callus myositis. General Principles of treatment, common fracture of upper extremity, Lower Extremity and fractures of the vertebrae. Newer methods of fracture Stabilization, Special

reference to exercises for post operative exercises and prevent joint stiffness, spinal prevention of deformities.

(b) Dislocation of Shoulder, Elbow, Hip, Knee and Spine.

(c) Soft tissue injuries: Rupture, contusion and sprains of muscle; Tendons and ligaments.

2. **Deformities:**

(a) Common foot deformity: Congenital torticollis, Cervical Rib, Spina Bifida.

(b) Acquired: Scoliosis, Kyphosis, Lordosis, Genu Valgum and Varum, Flat foot, Genu recurvatum, Pes cavus, Matatarsalgia, Claw hand, Mallet-Finger, Contractures.

3. **Operative Procedures And Orthopedics Appliances:**

(a) Reconstructive Operations - Arthrodesis, Cineplasty, Tendon Repairs and Transfers.

(b) **Amputations:** Common sites of amputations, Advantages and Disadvantages, Amputation of upper and lower Extremities.

4. **Inflammatory Diseases And Other Affections Of Bones:**

(a) Bone- Osteomyelitis, T.B. Bone.

(b) Joints Osteoarthritis, Rheumatoid Arthritis, T.B. Joints, Synovitis.

(c) Tendon Sheath and Bursa –Tenosynovitis.

(d) Osteomalacia Osteoporosis

5. **STUDY OF OTHER CONDITIONS IN ORTHOPAEDICS.**

RADIOLOGY

Practical knowledge of X-ray reading-X-rays of the following conditions-Fractures, dislocations, Arthritis, Tuberculosis, Bronchiectasis, Abnormalities of vertebral column.

Practical as per Syllabus.

PAPER III

PSYCHIATRY

1. **(a) Mental Health:**

   (i) Normal Mental Health.

   (ii) Criteria or normality of matured personality.

   (iii) Factors contributing to Normal Mental Health.

   (iv) Self-actualizing individual.

   (b) Study Of Abnormal Personality:

   Neurotic, Hysterical, Psychotic, Paranoid, Schizoid, Psychopathic etc.

2. **General Etiological Factors:**

   Hereditary, Genetic, Constitutional, Acquired Traumatic, Inductive, Toxic, Degenerative, Social and Environmental including pathogenic family pattern, Precipitating causes, frustration & conflicts.

3. **Symptomatology And Treatment Of:**

   (a) Psychosis:

   (i) Functional: Functional Schizophrenic, Reaction Group Simple, Paranoid, Catatonic, Hebephrenic, Paranoid, State, Paranoia, Juvenile. Schizophrenia, Autistic thinking, Dementia.

   (ii) Organic- toxic confused status, senile Psychosis, Arterio-Sclerotic Degenerative, G.P.I.

   (b) Affective Disorders:

   Dynamics of Mania, Hypomania, Chronic Mania, M.D.P. Involutional depression, Senile depression, Postpartum depressive reactions, Reactive and Neurotic depression, Endogenous depression, Suicide (Egoistic, Altruistic, Anomic).

   (c) Epileptive Disorders:

   Epileptic Psychosis.

4. **Neurosis:**

Symptomatology, Diagnosis and treatment and Psychodynamics of Anxiety State, Hysteria, Conversion reaction, Dissociative reaction, Dual personality, Obsessional, Neurosis, Phobias, Hypochondriasis, Neurasthenia and Mental fatigue.

5. **Mental Retardation:**

(i) Definition

(ii) Etiological factors: Pre-natal, Post-natal, Inceptive, Hormonal, Congenital.

(iii) Types of Mental retardation clinical types- Microcephaly, Hydrocephalus, Mongolism, Family idiocy, Phenylketonuria, etc.

(iv) Symptomatology of various grades of retardation, Differential diagnosis and treatment.

6. **Child Psychiatry:**

Behavior disorders- Nail bitting, Enuresis stealing, Truancy, Thumb sucking, Speech difficulties, Pica, Vomiting, Anorexia, Delinquency.

7. **Introduction To The Dynamics of Psychophysical Disorders:**

Asthma, Skin, Rashes, Hypertension, Bowel disorders.

8. **Introduction to treatment Psychiatry:**

(a) E.C.T.

(b) Insulin coma Therapy.

(c) Drug Therapy - (Tranquilizers, Mood elevators, hypnotics and sedatives).

(d) Psychotherapy- Deep and superficial , individual and group, expressive, suppressive, environmental manipulation, reductive.

(e) Psychodrama.

(f) Psychoanalysis.

(g) Play-therapy.

(h) Occupational Therapy and Physiotherapy.

PAPER IV
EXERCISE THERAPY- II

Students should have basic knowledge of assessment and evaluation of the pattern for selecting the techniques and methods for maximum functional restoration including indications and contra-indications.

1. **Massage Manipulations:**
   (i) Definition, classification and Contra-indication and effect of massage in general and specific.
   (ii) Preparation of the patient and lubricants.
   (iii) Techniques of different manipulations of massage on different parts of body:
      (a) Efflurage and stroking.
      (b) Petrissage- Kneading, picking, wringing.
      (c) Frictions.
      (d) Percussions- clapping, beating, pounding.
      (e) Vibration- shaking.

2. **Manipulations Of Joints:**
   (i) Manipulations of soft tissue and joints by passive means.
   (ii) Mobilization techniques of all joints.
   (iii) Traction by mechanical or manual methods.

3. **Re-Education Of Posture, Balance And Co-Ordination:**
   (i) Types of Posture, correct and incorrect posture and causes.
   (ii) Postural deformities.
   (iii) Postural exercise based on causes.
   (iv) Balancing exercises–progressed from most stable to difficult position relaxed to condition to patient.
   (v) Co-ordination exercises.

4. **Breathing Exercises & Postural Drainage:**
   (i) Normal breathing patterns.

(ii) Mobilization of thorax, localized breathing and exercises to develop respiratory muscles and improve vital capacity.

(iii) Postural drainage & Pre and Post operative Breathing exercises.

5. **Reduction of Hypertonicity and Rigidity and Initiation and stimulation of Muscle Contraction:**

(i) Maximum sensory stimulation when appropriate, for example. Touch, brushing, tendon tapping.

(ii) Irradiation from strong components in movements, from resistance to other part of the body, P.N.F.

(iii) Successive Induction.

(iv) Spasm, Spasticity: Support and positioning (including reflex inhibitory positions, shakings, movement for example reciprocal relaxation, hold relax, use of other parts of the body reflexes.

(v) Rigidity: Methods of facilitating movement.

6. **Re-Education Of Gait:**

(i) Normal human Locomotion.

(ii) Causes of gait deviation.

(iii) Exercises and methods to improve gait.

(iv) Uses of crutches and crutch walking.

7. **Hydrotherapy:**

(i) Physical and Therapeutic effects of exercise in warm water.

(ii) Principles of treatment buoyancy assisted, buoyancy as support, buoyancy resisting.

(iii) Starting positions.

(iv) Dangers and precautions.

(v) Pool, Tank and accessory equipment.

8. **Traction**:- Introduction, Types, Parameters, Indications, Contraindications, Dangers & Precautions.

9. **Stretching Exercises**:- Classification, Techniques, Physiological & therapeutic effects, Indications & Contraindications.

10. **Some Techniques Of Exercise –Therapy:**

(i) Group therapy.

(ii) Recreational therapy

(iii) Sport therapy.

(iv) Yoga therapy.

(v) Pre & Post Natal Exercises, Muscle Testing.

(vi) To study the muscle work, joint positions stability of fundamentals and derived positions.

EXERCISE THERAPY -II (PRACTICAL)

1. To practice all the soft tissue manipulation techniques of upper limb lower limb, neck, back & face.
2. To study & practice the various techniques of mobilization of joints - region wise.
3. To study & practice mat exercises & functional reeducation.
4. To assess & evaluate normal & abnormal posture & practice various corrective exercises.
5. To assess & evaluate equilibrium / balance & practice various techniques to improve balance.
6. To practice assessment & evaluation procedures including motor, sensory, neuromotor coordination, tests for incoordination & Frenkel's exercises.
7. To study & prctice techniques of postural drainage & breathing exercises, huffing, coughing, Valsalva maneuver & incentive sprirometry
8. To study & practice various techniques of PNF.
9. To study & practice use of walking aids in gait training & limb length measurement.
10. To study & practice various techniques for exercises used in Hydrotherapy.
11. To study & practice various traction techniques.
12. To study & practice various techniques of stretching exercises.
13. To study & practice various group exercises.

PAPER V
ELECTROTHERAPY- II

SECTION- I : HIGH FREQUENCY CURRENTS

I. INTRODUCTION TO HIGH FREQUENCY CURRENTS:

1. Introduction: Difference between low frequency and high frequency current and heat production in tissues.
2. Principles of production of High Frequency Currents-Circuit diagram and principles of working. Common methods of current regulation. Interference with Ratio communication and principles of stabilizing frequency and eliminations of Harmonics, Physiological and therapeutic effects.

II. SHORT WAVE DIATHERMY:

1. Application of short wave Diathermy, Condenser field and Induction methods. Heating of the tissues in series and parallel. Various methods in treating various types of tissues in Body-co-planner, contra planner, various types of coil methods. Size and spacing of electrodes, position of electrodes and various types of coils.
2. Techniques of application of S.W.D to various part of body in various conditions by suitable methods of achieving maximum effects. Application of Shortwave in general and in specific conditions to various parts of body.
3. Indications, Contraindications, Precautions & Potential Dangers.

III. MICRO WAVE DIATHERMY:

Principles of production (elementary knowledge): specific physiological and therapeutic effects. Application of Microwave in general and in specific conditions to various parts of body. Indications, Contraindications, Precautions & Potential Dangers.

IV. LONG WAVE DIATHERMY:

Introduction With Parameters, Production, Physiological & Therapeutic Effects, Techniques Of Application, Indications, Contraindications, Precautions & Potential Dangers.

V. ULTRA-SONIC THERAPY:

1. Definition of sound and Ultra sound and its physical properties velocity, density and characteristic impedance. Reflection, Refraction, Transmission, Absorption, Cavitation and half-value thickness.
2. Production of Ultra sound, Physiological and therapeutic effects of Ultra sound, Micro massage and thermal effect, Biological effects- Chemical and electrical effects.
3. Principles of Treatment–Technique of application, dose, indications and contra-indications, Dangers and precautions.

- **ELECTROMAGNETIC WAVES & ITS PROPERTIES:-**

  Electromagnetic waves, Electromagnetic spectrum, Physical properties of Electromagnetic radiations-reflection, Refraction, Absorption, Penetration, Grothus Law, Co-sine Law, Inverse spare law and their uses.

SECTION- II : ACTINOTHERAPY

I. LASER-THERAPY:

Principle of production, Physiology and therapeutic effects and its applications, Indications and Contra-Indications.

II. INFRA-RED AND ULTRA-VIOLET RADIATIONS:

Introduction and Physical Properties, Production.

Physiological and Therapeutic effects, Technique of applications, doses, dangers and pre-cautions.

-Special Technique of U.V. Radiations i.e. indolent wounds, Psoriasis, etc.

ELECTRO THERAPY - II (PRACTICAL)

1. To study a high frequency apparatus, its operation and application – region wise.
2. To study a Short Wave Diathermy Unit, its operation and different methods of application - region wise.
3. To study Micro Wave Diathermy Unit, its operation and methods of application – region wise.
4. To study Long Wave Diathermy Unit, its operation and methods of application – region wise.
5. To study an Ultra Sonic therapy unit, its operation and different methods of application – region wise.
6. To study different types of LASER units, their operation, application of LASER – region wise.

7. To study various types of Infrared lamps and their application to body-region wise.
8. To study different types of Ultra Violet units, their operation, assessment of test dose and application of U.V.R. – region wise.

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SYLLABUS
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EXAMINATION

PAPER I

PHYSIOTHERAPY IN GENERAL MEDICINE

SECTION– I

I. Pathological Changes:

1. Review of Pathological changes and principles of the treatment of Physical Therapy of –
2. Inflammation – acute, chronic and supportive.
3. edema – Traumatic obstructive Paralytic, edema due to poor muscle and laxity of the fascia.

II. Arthritis And Allied Conditions (In Details):

1. Osteoarthritis- Generalized, Degenerative and traumatic, Spondylosis and disorder.
2. Rheumatoid Arthritis, Still's diseases, infective Arthritis.
3. Spondylitis – Ankylosing Spondylitis.
4. Non-Articular Rheumatism–Fibro Myalgia, Funiculitis bursitis.

III. Diseases Of The Respiratory System:

1. Mechanism of Respiration.
2. Examination of chest of patiens and principles of physiotherapy treatment.
3. Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema.
4. Pleurisy and Empyema, Pneumonia
5. Bacterial Diseases – Tuberculosis.
6. Rheumatic fever-carcinoma of respiratory tract.

IV. Common Conditions Of Skin:

Acne, Psoriasis, Alopecia, Leucoderma, Leprosy.

V. Common Cardiac Disorders:

Thrombosis, Embolism, Buerger's disease, Arterio-Sclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive cardiac failure, hypertension.

VI. Deficiency Diseases: Rickets

VII. **Excretory Diseases** – Renal Failure, Renal Bone Diseases.

SECTION – II

PHYSIOTHERAPY IN NEUROGLOGY CONDITIONS

1. Examination of Neurological disorders and principles of treatment.
2. Hemiplegia, Paraplegia, Cerebral Palsy, Tabs dorsalis, Cerebellar ataxia, extra Pyramidal lesions (in details).
3. Disseminated Sclerosis, Peroneal Muscular Atrophy, Amyotrophic Lateral Sclerosis, Progressive Muscular Atrophy, Syringomylia sub-acute combined degeneration of cord (in outline).
4. Peripheral Nerve lesions (in detail)
5. Neuritis and Neuralgia- Brachial, Sciatica and facial palsy (in details) erb's palsy.
6. Infections– Poliomyelitis, Meningitis, Encephalitis, Poly neuritis.
7. Myopathies.
8. **Pediatrics and Geriatrics:**

(i) Special problems of elderly and children related special conditions to which they are prone.

(ii) Treatment as modified to their particular needs of each age group.

9. **Practicals**: Syllabus Evaluation of Long and short cases Demonstrations of Techniques.

PHYSICAL THERAPY PRACTICAL EXAMINTION

To examine and evaluate the patients suffering from Muscular Neurological and Skeletal conditions.

EXAMINATION:

1. **Motor**
   - -Muscle tone
   - -Muscle power grading
   - -Measurement of girth.
2. **Range of Motion:**
   - -Goniometry
   - -Contracture, deformity and measurement of limb length.
3. **Sensory:**

-Touch, Pain, Temperature, Pressure and Kinesthetic sense.

4. **Neurological:**

-Primitive Reflexes, Motor development, Superficial and deep tendon reflexes.

-Involuntary movements.

- In co-ordination.

- Gait.

5. **Respiratory System:**

-Measurement of chest expansion.

-Pattern of Breathing, Diaphragmatic, localized breathing.

6. **Functional Evaluation of A.D.L.'s:**

-The aims and plan of treatment of the patients suffering from the diseases as per theory syllabus.

- To operate the electro-therapeutic and mechanic-therapeutic equipment for treatment of patients as per Electro therapy and exercise therapy practical syllabus of year.

PAPER II

PHYSIOTHERAPY IN SURGERY

SECTION – I

PHYSIOTHERAPY IN SURGERY

1. Complications common to all operations: Pre and Post operative Physiotherapy.
2. Wounds, Local infections, Ulcers, Surgical procedures related to peripheral vascular diseases.
3. Burns, Degree of Burns, skin grafts.
4. **General Abdominal Surgery And Obstetrics And Gynecology:**
   - (i) Abdominal incisions: its pre and post operative physiotherapy.
   - (ii) Operations of stomach; intestines Appendectomy, Spleenectomy, Cholecystectomy.
   - (iii) Operations on abdominal wall, Hernia.
   - (iv) Operations of Genitourinary system; prostatectomy, Nephrectomy
   - (v) Prolapse; rectum.
   - (vi) Antenatal and Post natal training.
   - (vii) Complications of Pregnancy.
   - (viii) Weak abdominal and Pelvic floor muscles.
   - (ix) Stress incontinence.
   - (x) Prolapse Uterus.
   - (xi) Special Points related to Pelvic Surgery.
   - (xii) Pelvic inflammatory conditions.
   - (xiii) Surgery of the Breast Radical mastectomy, Physiotherapy related to above conditions.
5. **Thoracic Surgery:**
   - (i) Thoracic incisions, pre and post operative treatment and later rehabilitation of the patients.
   - (ii) Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty.
   - (iii) Operations on chest wall.
   - (iv) Common complications with emphasis to atelectasis, Pneumothorax, Broncho-pulmonary fistula, Pre and Post Operative Physiotherapy related to Cardiothoracic Surgery.

(v) Operations on pericardium and Heart, Chronic Constructive pericarditis, Valvular incompetence and stenosis. Mitral volvotomy, congenital heart defects, patent ductus arterious; Tetralogy of Fallot.

6. **Ear, Nose And Throat Conditions:** Otitis, media, sinusitis, Disomotor, Rhinorrhea, Adenoids, Tonsillitis, Physiotherapy related to above conditions.

7. **Neurosurgery:**

(i) Cranial Surgery: Head injuries, Intra cranial abscess. Intracranial Tumors.

(ii) Surgery of spinal cord and cauda equina. Spina Bifida and its complications. Infections of the spine. Epidural abscess, Tuberculosis. Lumber Disc Herniation and Cervical Disc Herniation. Laminectomy. Pre and post-operative Physiotherapy treatment related to above conditions.

(iii) Surgery of peripheral nerves. Peripheral Nerve injuries. Pre and Post operative Physiotherapy treatment as applicable to above conditions.

8. **Pre And Post Operative Physiotherapy, Relating To Plastic Surgery:**

Tendon transplantation in Leprosy, Polio etc. Pre and Post operative Physiotherapy related to above conditions.

SECTION – II

1. **Orthopaedics:**

(i) Fractures and dislocations.

(ii) Classifications.

(iii) Types of displacement.

(iv) Immediate and late signs and symptoms.

(v) Changes at fracture site and in surrounding tissues.

(vi) Reasons for Union, non-union, delayed union.

(vii) Methods of reduction and Fixation.

(viii) Healing of fracture and factors influencing.

(ix) Common fractures of upper and lower extremity and their complication.

(x) **Physiotherapy For Each Fracture:**

(a) During immobilization period.

(b) During mobilization period.

(xi) Dislocations with possible complications.

(xii) **Corrective Surgery:**

(a) Arthroplasty, Arthrodesis, Osteotomy, Tendon Transplant, Soft tissue release, grafting.

(b) Physiotherapy treatment as applicable to above conditions.

II. (i) **Soft Tissue Injuries:** Synovitis, Capsulitis, Bursitis, etc. Volkmann's ischemic contracture.

(ii) Crush injuries.

(iii) Repair of injured tendon and Nerves.

(iv) Injuries of Semilunar cartilage and cruciate ligaments of knee; Physiotherapy treatment as applicable to above conditions.

III. Deformities:

(i) **Congenital**: Torticollis, cervical rib, Sprangles shoulder, spina-bifida, hallux valgus, pes cavus, pes planus and other common deformities.

(ii) **Acquired:** Scoliosis, Kyphosis, Lordosis, Coxa Vara, Genu Valgum, Genu varum and recurvatum, Planus and other common deformities.

(iii) Other miscellaneous Orthopedic conditions commonly treated by Physiotherapy.

(iv) Physiotherapy treatment related to above conditions.

IV. (i) **Amputation:** Traumatic; Elective; Common sites of amputation in upper and lower extremities. Advantages and disadvantages. Physiotherapy treatment as applicable to care of Prosthetic training with emphasis on lower extremity.

Note:

Emphasis should be on the assessment of disability with the selection of treatment based on these.

Where possible treatment should be related to the activities of daily living and patients occupation and directed towards the development of self-confidence and independence.

PHYSICAL THERAPY PRACTICAL EXAMINATION

To examine and evaluate the patients suffering from Muscular Neurological and Skeletal conditions :

I. EXAMINATION:

1. Motor

- Muscle Tone
- Muscle power grading

- Measurement of girth.

2. Range of Motion:

- Goniometry
- Contracture, deformity and measurement of limb length.

3. Sensory:

- Touch, Pain, Temperature, Pressure and Kinesthetic sense.

4. Neurological:

- Primitive Reflexes, Motor development, Superficial and deep tendon reflexes.
- Involuntary movements.
- Gait.

5. Respiratory System:

- Measurement of chest expansion.
- Pattern of Breathing, Diaphragmatic, localized costal breathing.

6. Functional Evaluation of A.D.L.'s:

I. The aims and plan of treatment of the patients suffering from the diseases as per Theory Syllabus.

II. To operate the electro-therapeutic and mechanic-therapeutic equipments for treatment of patients as per Electro therapy and exercise therapy practical syllabus of year.

PAPER III

REHABILITATION AND THERAPEUTIC MANAGEMENT

1. **REHABILITATION**: Concept and Principle.
   - (a) The Philosophy and Need of Rehabilitation.
   - (b) Principles of Rehabilitation Medicine.
   - (c) Basic Principles of Administration and Organization.
2. **REHABILITATION APPROACH:**
   - (i) Nursing.
   - (ii) Communication problem.
   - (iii) Social Problems.
   - (iv) Psycho-social aspect.
   - (v) Vocational problems and vocational placement.
   - (vi) Community Based Rehabilitation Programme & Community Resources.
   - (vii) Other aspects of Rehabilitation
3. Rehabilitation programme for Medical, Surgical, Orthopedic, Neurological conditions and various other clinical conditions, and in specific conditions.
4. **COMMUNITY MEDICINE:-**
   - Concepts of preventive Medicine, Social Medicine, Public Health & Community Medicine.
   - Social Factors relating to Health & Disease.
   - Concepts of Health & Disease: Natural History of Disease; Disease causation.
   - Principals of Prevention & Control of Diseases.
   - General Epidemiology & Epidemiological Methods. Uses of Epidemiology.
   - Study of various Vaccines & Immunizations.
   - Health Education, Communicaion and Counselling.
   - Occupational and Industrial Health & Hygiene.
   - Maternal & Child Health Care; Infant Care; Normal Growth & Development.
   - Community Paediatrics & Geriatrics; School Health Service.
   - Sexually transmitted Diseases (STD) & HIV; Prevention of Blood born Disease.
   - Primary Health Care, Setup Organization & Functions.
   - Comprehensive Health Care including Rehabilitation of Disabled & Handicap India.
   - Disaster Management.

THERAPEUTIC AND CLINICAL MANAGEMENT

(PRINCIPLE & PRACTICE)

The students are required to undergo detail study and extensive Practical Training and Clinical Practice in the following areas to qualify and authorize them to practice Physiotherapy or Occupational Therapy system and Western Medical Science for Preventive, Curative, Restorative treatment and Rehabilitative management as well as Health Care of the patients and disability groups.

1. Clinical evaluation and investigation.
2. Diagnosis and differential diagnosis.
3. Prescription writing and treatment planning.
   (a) Use of Physiotherapy or Occupational Therapy system for functional, Physical and Mental Restoration or other desired achievement.
   (b) Principle and Practice of Western Medical Science and Modern Scientific System of Medicine and its application in various clinical conditions.
   (c) Method of Prescribing the treatment of general or common diseases or illness or any associated clinical problems existing earlier or arising during or after the process of Physiotherapy or Occupational Therapy System; through Modern Scientific Medicine.
4. Referral approach for specialized diseases or clinical conditions
5. Rehabilitative approach and management.
6. Disability percentage & Certification, Physical fitness condition and certification.

PAPER IV

PROSTHETICS & ORTHOTICS

SECTION – I : ORTHOTICS

Principle, Fabrication, measurement, fitting, training and check out.

1. Orthotic component and system:
   Terminology, Objectives, Types of Hand, Orthotics, U.E. (Upper Extremity) Shoulder, elbow, wrist)
2. Orthotic component and system Terminology, Description, Fabrication and fitting and types- Hip, Knee, Ankles and foot.
3. Shoe and shoe modification.
4. Spinal Orthotics:

   COMPONENTS:

   (a) Pelvic band
   (b) Thoracic band.
   (c) Anterior extension of Thoracic band with subclavicular extension.
   (d) Lumbo Sacral and thoracic uprights.
   (e) Lateral uprights.
   (f) Oblique lateral uprights.
   (g) Infra and capsular band.
   (h) Full front abdominal support.

   TYPES:

   (i) Chair back (ii) Knight (iii) William (iv) Taylor (v) Knight Taylor (vi) Collars (vii) Flexible Spinal Corsets & belts (viii) Jewitt (Ash Brace) (ix) Cervical Orthotics (x) Milwaukee's Principle & indication (xi) For treament.

SECTION – II : PROSTHETICS

Principle; Fabrication; Measurement; Fitting, Training & Check Out.

1. **PROSTHETIC COMPONENT PARTS AND SYSTEM:**

   (a) Terminal device, wrist unit and elbow unit, upper arm cuff, sockets, cable components and harness, stump sock.

(b) Pre-prosthetic training.

(c) Prosthetic training – (i) Check out (ii) Control system & Efficiency.

(d) Prosthetic training programme.

2. **(a) FOOT AMPUTATION**

(b) Symes

(c) Below knee

(d) Through knee

(e) Above knee

(f) Hind Quarter.

3. **PROSTHETIC COMPONENTS FOR BELOW KNEE:**

(a) Post Ankles Assembly

(b) Conventional foot

(c) Sach foot

(d) Internal keel

(e) Shank

(f) Socket, P.T.B. Socket, Air Cushion Socket, Suspension System, Supracondylar Calf, Supracondylar Walls on Flare, Supra Patellar Walls on Socket.

(g) Biomechanics of Below Knee Prosthesis;

4. **PROSTHETIC COMPONENTS OF THROUGH KNEE:**

(i) Conventional

(ii) Suction Socket

(iii) Quadrilateral Socket

(iv) Hip disarticulation

5. Prosthetic For Hind Quarter & very short above knee stumps, (a) Saucer socket (b) Tilting Table (c) Canadian.
6. Prosthetic joint deviations in A.K. & B.K. Prosthesis.
7. Prosthetic gait and gait analysis.
8. Self help devices, Rehabilitation aids.

PAPER V
APPLIED MATHEMATICS AND STATISTICS

1. Frequency distribution, Normal distribution Curve, Histogram.
2. Measures of Central Value- Mean, Median, Mode.
3. Measures of Variability – Range, Semi-Inter-Quartile Range (S.I.Q.R.) Standard Deviation, Variance, Coefficient of Variation.
4. Finding Percentile Norms, Percentile Rank by interpolation in cumulative distributions.
5. Correlation– Coefficient of Correlation; Rank–Difference Correlation.
6. Reliability and Significance – Standard Error of a Mean and its interpretation, Reliability of a difference between Means.
7. Testing Hypotheses–'T' and 'F' tests.
8. Computation of Chi Square from a contingency table and its interpretation.

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