

Human Anatomy

M. Marks: 200

Theory: 100

Practical: 100

ANATOMY (THEORY)

A. GENERAL ANATOMY:

1. **Histology**-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve etc.
2. **Osteology**-Type of Bone, Growing End, Ossification Centers, Formation, function, growth and repair of bones.
3. **General Embryology**-Ovum, spermatozoa, fertilization, differentiation, development of various systems and foetal circulation.
4. **Nervous tissue**: Structure of neuron, Synapse, reflex arc, Wallerian Degeneration and regeneration of nerve
5. **Muscles**: classification, examples, Microscopic features, emphasis on Skeletal Muscles
6. **Joints**: Definition, general classification with examples

B. SYSTEMS OF HUMAN BODY (A BRIEF OUTLINE):

1. **Blood Vascular System** – Arteries, capillaries, veins, heart, and lymphatic system.
2. **Respiratory System** – Anatomy of upper and lower respiratory tract including nose, larynx, trachea, bronchi, pleura and lungs.
3. **Digestive System** – Anatomy of the gastro-intestinal tract.
4. **Urogenital System** – Anatomy of Urinary system, male and female reproductive system.
5. **Endocrine System** – The various organs and production of hormones including definition, structures in general, control of secretions and role of hypothalamus.
6. **Integumentary System**
7. **Surface Anatomy**

C. NEURO-ANATOMY: MICROSCOPIC AND GROSS STUDY OF: -

Peripheral Nerves, Cranial Nerves, Autonomic Nervous System, Cerebral Cortex, Midbrain, Pons, Medulla, Cerebellum, Thalamus, Hypothalamus, Epithalamus, Corpus Striatum, Ventricles, Meninges, Cerebro Spinal Fluid, Blood supply of the Brain, Internal Capsule, Pyramidal System and Extrapyramidal System, Details of Spinal Cord and its Tracts, Neuromuscular Junction, Sensory End Organs etc.

D. UPPER EXTREMITY

i) Osteology

– Outline the anatomical features, attachments, ossification and side determination of the bones of Upper Limb : Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges

ii) Myology

- Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action.
- Muscles of front and back of forearm: origin, insertion, nerve supply and action.
- Mention the small muscles of hand with their origin, insertion, nerve supply and action.
- Identify the nerves of upper units and mention their position course, relations and distribution.
- Detail explanation of joints of upper limb: Scapulothoracic Joint, Shoulder joint, Elbow Joint, Wrist and joints of hand.
- Indicate the blood vessels of upper limb and mention their position course, relations, distribution and main branches.
- Lymphatic damage of upper limb
- Applied anatomy of all structures of Upper Limb

E. REGIONAL ANATOMY

Detailed explanation of the following with their applied anatomy

- Pectoral Region
- Scapular Region
- Cubital Fossa
- Axilla
- Brachial Plexus: Position, formation and branches
- Spaces of the hand

F. TRUNK-THORAX & ABDOMEN

i) Osteology

- Vertebral columns: Identify the parts of typical vertebra and state the main features, attachments and ossification.
- Intervertebral disc and mention its part.
- Ribs: Parts and main features of typical rib and define true, false and floating ribs.
- Sternum: State the parts and anatomical features.

ii) Myology

- Fascia and muscles of back
- Fascia and muscles connecting Upper Limb with vertebral column: origin, insertion, nerve supply and action.
- Intercostal muscles and diaphragm: origin, insertion, nerve supply and action.
- List layers of anterior abdominal wall and mention its origin, insertion, nerve supply and action of these muscles.
- Fascia and muscles of posterior abdominal wall: origin, insertion, nerve supply and action.

iii) Joints of Thorax

Identify the various joints and explain in detail:

- Manubriosternal joint
- Costo vertebral joint
- Costo transverse joint
- Costo Chondral joint
- Chondro sternal joints
- Inter vertebral joint
- Movements of vertebral column
- Respiratory movements
- Mention the course and branches and nerves, blood vessels and lymphatic drainage of trunk-thorax-abdomen.
- Lumbar Plexus: Position, formation and branches.
- Rectus sheath: formation and contents.
- Contents of vertebral canal
- Intercostal space and its contents
- Diaphragm-structures passing through it.
- Applied Anatomy of structures of trunk – thorax – abdomen

G. PELVIS

- Features of pubic symphysis and sacroiliac joints.
- Muscles of pubic floor and mention their attachments, action and nerve supply.
- Difference between male and female pelvis.
- Main features of subdivision, boundaries, walls and floor of pelvis.
- Urogenital diaphragm (outlines only)
- Applied anatomy of plexus
- Lymphatic damage
- Nerve supply
- Sacral Plexus
- Mention the blood vessels of the region with course, variations, distribution and main branches.

H. LOWER EXTREMITY

i) Osteology

- Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot

ii) Myology

- Fascia and muscles in front of thigh: Origin, Insertion, Nerve Supply, and Action
- Fascia and muscles of medial side of thigh: Origin, Insertion, Nerve Supply, and Action
- Fascia and muscles of back of thigh
- Fascia and muscles of gluteal region
- Fascia and muscles of front of leg and dorsum of foot
- Fascia and muscles of lateral side of leg
- Fascia and muscles of back of leg and role of foot
- Detailed explanation of joints of Lower Leg: Pelvic Girdle, Hip joint, Knee joint, Ankle joint, joints of foot.

- Study of the nerves of Lower Leg and mention their position course, relations and distribution
- Indicate the blood vessels of Lower Leg and mention their position course, relation, distribution and main branches
- Lymphatic drainage of Lower Leg
- Explain femoral triangle, Adductor Canal and Subsartorial canal
- Popliteal fossa
- Anatomy of structures of Lower Leg, Arch of Foot

Anatomy (Practical)

1. Surface Anatomy: To study, identify and mark the surface landmarks on human body.
2. To study the muscles of trunk, lower and upper extremities and face on a dissected human body.
3. To study the Bones of Human Body with special emphasis on origin and insertion of muscles and ligaments.
4. To study the anatomy of joints of upper and lower extremities and vertebral column on models, charts.
5. To study the anatomy of C.N.S and P.N.S on models, charts.
6. To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system on models, charts.

Human Physiology

M. Marks: 200

Theory: 100

Practical: 100

1. Introduction on Physiology.
2. Cell and tissue, its structure.
3. Body Fluid:
 - Blood: Composition and general function of plasma, Blood cells – structure and function- Red Blood cells, white blood cells including numbers and approximate length of life position, structure and function of cell of reticulo endothelial system
 - Blood clotting including bleeding time and clotting time, factors accelerating and slowing the process
 - Blood group and their significance, Rh- Factor, Haemoglobin and ESR
 - Formation of Blood, tissue fluid and Lymph
4. **Cardio Vascular System**
 - Structure and properties of Heart muscles and nerve supply of Heart. Structure and functions of arteries, capillaries and veins, Cardiac cycle and Heart sound, Factors affecting Heart Rate and its regulation, Cardio-vascular reflexes, Blood pressure and its regulation, physiological variation, peripheral resistance, Factors controlling Blood Pressure, Haemorrhage
5. **Respiratory System**
 - Mechanism of Respiration, changes in diameters of thorax, Intrapleural and Intrapulmonary pressure, Quantities of Lung Volume, Tidal and Residual Volume, Vital Capacity, Gaseous interchanges in lung and tissues
 - Control of Respiration – Nervous and Chemical significance of change in rate and depth, transportation of oxygen and carbon-di-oxide, Respiratory states- Hypoxia, Asphyxia, Cyanosis, Acclimatization
6. **Digestive System**
 - General arrangement of alimentary canal, liver and pancreas position, structure.
7. **Reproductive System**
 - Development of Puberty, Male Sex Hormones, Spermatogenesis, Female Sex Hormones, Menstrual cycle, Ovulation, Pregnancy and Lactation, Function of Placenta
8. **Excretory System**
 - Gross and minute structures of kidney, renal circulation, mechanism of formation of urine. Glomerular filtration rate and tubular function, renal function.
9. **Endocrine System**
 - Structure and function of pituitary (anterior and posterior) gland, Thyroid, Para-Thyroid, Adrenal Cortex, Adrenal Medulla, Thymus and Pancreas, Blood Sugar regulation
10. **Skin Structure and Function**
11. **Neuromuscular Physiology:**
 - a. **Cell Membrane:** Ionic and potential gradient and transport
 - b. **Muscle:** Types of Muscular tissue, gross and microscopic structure, function, Basis of muscle contraction, changes in muscle contraction. Electrical – Biphasic and Monophasic action potentials, chemical, thermal and physical changes, Isometric and Isotonic contraction, Motor units and its properties – clonus, tetanus, all or none law, fatigue

- c. **Nerve:** Gross and microscopic structure of nervous tissue, One Neurone- generation of action potential- nerve impulse-condition
- d. **Neuromuscular Junction**
- e. Degeneration, regeneration of peripheral nerves, Wallerian Degeneration, Electro tonus and Pflagers law.
- f. Types and properties of receptors, types of sensations, synaptic reflex arc and its properties – occlusion, summation , subminimal fatigue etc
- g. Tracts – Ascending and Descending tracts of the spinal cord, Pyramidal Tracts
- h. Functions of Cerebral Cortex
- i. Functions of Cerebrum
- j. Functions of Cerebellum
- k. Functions of Basal Ganglia
- l. Thalamus: Connection and function
- m. Reticular Formation: Tone, Posture and Equilibrium
- n. Autonomic Nervous System
- o. Special Senses: Eye – errors of refraction, lesions of visual pathways
- p. Speech and its Disorders
- q. Ear and vestibular apparatus, taste, olfactory and somatic sensations

12. Physiology of Exercise and Work

- a. Neuromuscular activity, Human Movement, Physiological mechanism in movement behaviour, skill, strength, endurance, analysis of movement
- b. Circulatory and respiratory response to exercise and work, the heart, blood circulation, body fluid changes, pulmonary ventilation, gas exchange and transport
- c. Effects of exercise and work on other body functions

Physiology Practical

To study the following Physiological Phenomena: -

1. Identification of blood cells and different counts.
2. White Blood Cell Count.
3. Red Blood Cell Count. Clotting Time and Bleeding Time
4. Haemoglobin percentage
5. E.S.R. and Blood groups.
6. Bleeding time and clotting time
7. Pulse rate, Heart rate and measurement of Blood Pressure.
10. Respiratory rate and Auscultation.
11. Reflexes – Superficial and Deep Sensations
12. Tests for functions of Cerebrum.
13. Tests for functions of Cerebellum.

Biochemistry

M. Marks: 50
Theory: 50

1. **Biophysics:** Concepts of PH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.
2. **Cell:** - Morphology, Structure and functions of cell, cell membrane, Nucleus, Chromatin, mitochondria, endoplasmic reticulum, Ribosome.
3. **Carbohydrate:** - Definition, functions, sources, classification, monosaccharide, Disaccharides, Polysaccharides, Muco-polysaccharides and its importance.
4. **Lipid:** - Definition, functions, sources, classification, simple lipids, compound lipids, derived lipids, Saturated and unsaturated fatty acids, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance.
5. **Proteins:-** Definition, Sources, Functions, Classification, simple protein, congregated proteins and derived proteins properties and reactions of proteins.
6. **Nucleic acids:** - Structure and functions of DNA, RNA, Nucleosides, Nucleotides, biologically important Nucleotides including energy rich compounds.
7. **Enzymes:** - Definition, Classification, mode of action, factors, affection, enzyme action.
8. **Vitamins:** - Classification, Fat-soluble vitamins A, D, E, K Water soluble vitamins-B Complex and Vitamin C. Daily requirement physiological functions and disease of vitamin deficiency.
9. **Bio-energetic:** Respiratory chain and Biological oxidation.
10. **Carbohydrate Metabolism:** Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, maintenance of Blood glucose, Inter conversion of different sugars.
11. **Lipid metabolism:** Metabolism of cholesterol, Ketone bodies, Athero-sclerosis and obesity, Lipo Protein of their metabolism.
12. **Protein metabolism:** Transamination, Transmethylation, Dearmination, Fate of Ammonia Urea synthesis and synthesis of creatinine, inborn errors of metabolisms.
13. **Water and electrolytes:** Fluid compartments, Daily intake and out- put, Dehydration, Sodium and potassium metabolism.
14. **Mineral metabolism:** Iron, Calcium, Phosphorous, Trace elements.
15. **Nutrition:** Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, metabolism in exercise and injury. Diet for chronically ill and terminally ill patients.
16. **Connective Tissue:** Mucopolysaccharides, Connective tissue proteins, Glycoproteins, Chemistry and metabolism of bone and teeth. Metabolism of skin.
17. **Nerve Tissue:** Composition, Metabolism, Chemical mediators of nerve activities.
18. **Muscles Tissue:** Structure, metabolism of muscles, muscle contraction.
19. **Hormones:** General characteristics and Mechanism of Hormone actions, Insulin, Glucose, Thyroid and Para-Thyroid hormones. Cortical sex hormone.

Exercise Therapy (Part I)

M. Marks: 200
Theory: 100
Practical: 100

Section – I

1. Introduction to Exercise therapy, Principles, techniques and general areas of its application, Assessment & its importance,
2. **Mechanics:** Force, Gravity, line of gravity, center of gravity in human body, Base, Equilibrium, Axes and Planes, mechanical principles of Lever, order of lever, examples in human body, Pendulum, Spring.
3. Descriptions of fundamental starting positions and derive position including joint positions, muscle work, stability, effects and uses.
4. Introduction to Movements including analysis of joint motion, muscle work and neuromuscular coordination.
5. **Classification of movements:** Describe the types, technique of application, indications, Contraindications, effects and uses of the following:
 - a. Active Movement
 - b. Relaxed passive movements, basic knowledge of classification of relaxed passive movements, definition, technique, effects and uses of relaxed passive movements
 - c. Active assisted movement
 - d. Resisted exercises- Techniques and types of resistance, Oxford method, Delorm method, Mc queen method, Zinoviff Method, DAPRE Method, SAID Principle
6. **Suspension Therapy:** To study the principles, techniques of application indication at various joints of the upper limbs and lower limbs, Contraindication, Indications, Precautions, effects and uses of
7. **Assisted Exercises:** Technique and uses
8. **Free exercises:** Classification, technique, Effects of frequent exercises on various systems
9. **Posture:** Types, factors responsible for good posture, factors for poor posture, principles of development of good posture
10. Bed Rest Complications

Section – II

Manual Muscle Testing

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

Section – III

Goniometry:

Goniometers and its types

- a) Principles, techniques and application of Goniometry.
- b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk
- c) Causes of restriction of joint movement, prevention of restriction of joint range of motion etc

Section – IV

Soft Tissue Manipulation (Therapeutic Massage)

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulation on the following systems of the body; Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.

c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

d) Preparation of patient: Therapeutic Effects, uses, indications and contraindications of the above manipulation

Section – V

Relaxation & Therapeutic Gymnasium

Relaxation

1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
2. Factors contributing to fatigue & tension.
3. Techniques of relaxation (local and general)
4. Effects, uses & clinical application.
5. Indication & contraindication.

Therapeutic Gymnasium

- i) Setup of a gymnasium & its importance
- ii) Various equipments in the gymnasium
- iii) Operational skills, effects & uses of each equipment

Exercise Therapy - I (Practical)

- 1) To practice the entire soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.
- 2) To practice the measurement of ROM of joints – upper limb, lower limb & trunk.
- 3) To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.
- 4) To study the position of joints, muscle work, and stability of various fundamental and derived positions.
- 5) To study the different types of muscle contraction, muscle work, group action of muscles and coordinated movements.
- 6) To practice the various types of suspension therapy and its application on various parts of body – region wise.
- 7) To study & practice local & general relaxation techniques.
- 8) To study the structure & function along with application of various equipment in a Gymnasium.

Electrotherapy (Part I)

M. Marks: 200

Theory: 100

Practical: 100

1. **Electrical Fundamentals**-Physical Principles-Structure and properties of matter" molecular atom, proton, neutron, electron, ion, etc. Electrical Energy: Nature of electricity-Current Static Electricity Current - Electric potentials generated by cell-Ohm's Law, Joule's Law.
2. **Magnetic Energy**: Nature and property of a magnet, magnetic induction snow rule, Mexwel corkscrew rule, Electromagnetic induction, Principle of working of choke coil-transformer-rectification of A.C to D.C. Metal Oxide Rectifier, Semi-conductor-Diode and Triode.
3. **Valves**-Principle working-condenser-principle-Details of charging and discharging, etc. Transistors, measurement of current intensity, EMS and power-moving coil millimeter and voltmeter.
4. **Electrical supply**:
 - a) Brief outline of main supply of electric current.
 - b) Dangers – short circuits, electric shocks.
 - c) Precautions – safety devices, earthing, fuses etc.
 - d) First aid & initial management of electric shock.
5. **Low Frequency Currents**:
 - a. Introduction to direct, alternating & modified currents.
 - b. Production of direct current – Physiological and therapeutic effects of constant current, anodal and cathodal Galvanism, Ionization and their application in various conditions.
 - c. Iontophoresis – Principles of clinical application, indication, contraindication, precaution, operational skills of equipment & patient preparation.
 - d. Modified direct current – various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of interrupted and surged current & their effects
 - e. Modified direct current – Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skills of equipment & patient preparation.
 - f. High Voltage Pulsed Galvanic Stimulation, Diadynamic Currents
6. **Transcutaneous Electrical Nerve Stimulations (TENS)**:
 - a) Types of Low Frequency, pulse widths, frequencies & intensities used as TENS applications.
 - b) Theories of pain relief by TENS.
 - c) Principle of clinical application effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.
7. **Electrogenic membranes response**-chemo responsive electrogenic systems. Neuromuscular junction-synapse-muscle electrogenic electro physiology of C.N.S.
8. **Electrical Reactions and Electro – diagnostic tests**:
 - Electrical Stimuli and normal behavior of Nerve and muscle tissue.
 - Types of lesion and development of reaction of degeneration.
 - Faradic – Intermittent direct current test.
 - S.D. Curve and its application.

- Chronaxie, Rheobase, F.G.Test etc

9. Infra red rays – Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.

10. Ultraviolet rays (UVR):

a) Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.

b) Dosimetry of UVR.

11. Superficial heat - Paraffin wax bath, moist heat, electrical heating pads, Contrast bath, Whirl pool bath, Fluido therapy

a) Mechanism of production.

b) Mode of heat transfer.

c) Physiological & therapeutic effects.

d) Indications, contraindications, precautions, operational skills of equipment & patient preparation.

12. Cryotherapy: Principles, Physiological effects, uses of Cold packs, Ice massage, Commercial Cold Packs, Ice Towels, Cold compression Units, Evaporating Sprays.

Electrotherapy 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, including the upper & lower limb, trunk

4. Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Ionotophoresis.

5. To study the reactions of degeneration of nerves, to plot strength duration curves.

6. To find chronaxie and Rheobase.

7. To study a hydrocollator unit, its operations and therapeutic application of Hot packs –region wise.

8. To study the various types of Infrared lamps and their application to body region wise.

9. To study a paraffin wax bath unit, its operation and different methods of application – region wise.

10. To study the different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – region wise.

11. To study a TENS Stimulator, its operation and application – region wise.

12. To study various forms of therapeutic cold application region wise including – ice, cold packs, vapocoolant sprays, etc.

Pathology, Microbiology and Microbiology

M. Marks: 100
Theory: 100

General Pathology

Marks: 30+10 (I.A.)

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions
2. Causes of disease and cell injury – features of cell injury, mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene
3. Inflammation- definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation
4. REPAIR –primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements – oedema, hyperemia, Haemorrhage, shock, embolism, thrombosis, infarction
6. Immunity – natural and acquired immunological mechanisms of tissue injury, hypersensitivity reactions, general features of autoimmune diseases and immunodeficiency diseases.
7. Neoplasia: characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host
8. Nutritional disorders: deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E,) causes , features , a brief outline of the methods of diagnosis.

Systemic Pathology: A brief outline of etiology, pathogenesis and general features of disease of the following systems. (The morphology, microscopic details and details of diagnostic procedures are not required).

1. **Blood:** Disorders of RBC, WBC and platelets
2. **Blood Vessels:** Atherosclerosis, thromboangitis obliterance, varicose vein, DVT, thrombophlebitis, lymphoedema
3. **Disease of Heart:** Congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)
4. **Respiratory System:** Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis etc.
5. **Joints Disorders:** Arthritis- types and their features.
6. **Bone Disorders:** Osteoporosis, Paget's disease, Osteogenesis Imperfecta, Osteomyelitis, tumors– Osteosarcoma, Chondrosarcoma, Ewing's sarcoma, Multiple myeloma (a brief outline only)
7. **Muscles:** Muscular dystrophy, Myasthenia gravis
8. **Nervous System:** Meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

Microbiology

Marks: 25+5 (I.A.)

1. An introduction to microbiology, Classification of microorganisms,
2. Infection – Types, source, portals of entry, spread.
3. Prevention and control of infection, Disinfection and antiseptics Sterilization
4. An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required)
Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies, STD, Ameobiasis, Kalaazar, Malaria, Filaria

Pharmacology

Marks: 25+5 (I.A.)

1. General Pharmacology, drug allergy & idiosyncrasy, drug toxicity, different routes of administration.
2. Autonomic pharmacology.
3. Drugs acting on CNS/PNS Anesthetics, alcohols, alkaloids, narcotics, analgesics, antipyretics, sedatives, stimulants & psychotherapeutics.
4. Drugs acting on C.V.S
5. Drugs acting on respiratory system.
6. Antibiotics & chemotherapeutic agents
7. Hormones and drugs affecting endocrine functions.
8. Drugs acting on G.I.System.
9. Immunomodulators
10. Vitamin D, Calcium, Iron, Blood related diseases
11. Heavy metals & antagonists.
12. Drugs acting on Muscles, Muscles relaxants.

Psychology and Sociology

Theory: 100

Section –A (Psychology)

Marks: 40+10 (I.A.)

A Sound knowledge of psychology is essential to help the student understand himself/herself and other people have to develop into personal relationships. This knowledge should then be applied in working with any patient and as a member of the Treatment team. This subject will form the basis for later study of psychology.

I. General Psychology:

1. **Definition of Psychology.**
Science of mind, consciousness and behavior , Scope and branches of Psychology , Methods of Introspection, observation and experimentation.
2. **Hereditary and Environment**
Relative importance of heredity and environment , Physical characteristics intelligence and personality.
3. **Learning**
Types of learning
Trial and error, Classical Learning Instrumental learning, Insight for learning
4. **Memory**
Steps of memory, Measurement of memory, Causes of forgetting(diff. types only), Concept Of STM & LTM
5. **Perceptual Process**
Nature of perceptual process, Structural and functional factors in perception, Illusion and Hallucination
6. **Emotion**
Emotion and feeling, Physiological changes, Theories of emotion (James-Lange and Eonnon-Bird)
7. **Motivation**
i) Motive need and Drive, Types of motive: Physiological, Psychological and Social
8. **Intelligence**
Definitions: theory and assessment of I.Q.
9. **Personality:** Definition, Types and measurement.

II. Child Psychology

Concept of child Psychology - Meaning, nature, and subject matter of child Psychology, Practical importance of studying child Psychology for Physiotherapist or rehab team member Methods of studying child development, Baby Biography, Case History, Behavioral abnormalities.

III. Industrial Psychology:

1. Human Engineering, Importance of human engineering, Development in human engineering, problems in human engineering
2. Decision making process and steps indecision making, Individual decision making, decision making in organization
3. Stress and mental health, causes and reaction to stress, job stress and its management
4. Work culture, moral and reward of work discipline
5. Guidance and counseling- different types of counseling, meaning types and objectives of counselor.
6. **Rehabilitation Psychology:**
Purpose of studying, Interpersonal relationships, Familial & Social relationships, acceptance about the disability – its outcome in relation to different diagnostic categories psychological aspects of multiple handicapped, contribution of psychology in Total Rehab. Specific Rehabilitation Programme

Section B: (Sociology)

Marks: 40+10 (I.A.)

1. Introduction

Definition of Sociology, Sociology as a science, uses of the study of Sociology, application of knowledge of sociology in Physiotherapy

2. Sociology and Health

Social factors affecting health status

3. Socialization

Meaning of socialization

4. Social groups

Concepts of social groups: formal and informal group (Definition only), primary groups and secondary groups (Definition only)

5. Family

Definition, Influence of family on human personality, Types, Functions of a Family

6. Culture

Definition and Relevance

7. Caste system

Definition and utility

8. Social Control: Definition, Customs, Law

9. Social problems : names and reasons with solutions as a whole

10. Social security: Definition

Biomechanics & Kinesiology

M. Marks: 200

Theory: 100

Practical: 100

1. Basic Concepts of Biomechanics
 - a. **Kinematics:** Description of Motion, Types of Motion, Location of Motion, Direction and Magnitude of Motion
 - b. **Kinetics:** Analysis of Forces, Definition, Force of Gravity, Reaction of Forces, Equilibrium, Objects in Motion, Force of Friction, Concurrent Force Systems, Parallel Force Systems, Work, Moment arm of Force, Force Components, Equilibrium of Levers
2. **Joint Structure and Function:** Joint Design, Specific connective tissue structures, General Properties of Connective Tissue, Human Joint Design, Kinematic Chains, Arthrokinematics and Osteokinematics
3. **Muscle Structure and Function:** Mobility and Stability Functions of Muscles, Elements of Muscle Structure, Muscle Function, Effects of Immobilization, Injury and Aging on Muscle Tissues
4. **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
5. **Biomechanics of Shoulder Complex:** Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex, Structural and Functional Dysfunctions around Shoulder Complex
6. **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
7. **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
8. **Biomechanics of Temporomandibular Joint**
9. **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
10. **Biomechanics of the Knee Complex:** Structure and Function 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
11. **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
12. **Biomechanics of Gait:** Kinematics of Gait, Phases, Spatiotemporal Parameters of Gait, Determinants of Gait, Energy requirements, Kinetics of Gait, External and Internal Forces, Kinetics and Kinematics of the Trunk and Upper Extremities, Stair climbing gait, Effect of age, Gender, Assistive Devices, Disease States, Muscle pathology, Malalignments, Injuries and limb length discrepancies on Human Gait
12. **Posture:** Static and Dynamic Posture, Major Goals and basic elements of Postural control, Kinetics and Kinematics of Posture, Inertial and Gravitational Forces, Ground Reaction Forces, Optimal or Ideal Posture, Biomechanics analysis of Posture in all planes, Effect of Age, Pregnancy, and Pathology on Posture

Exercise Therapy (Part II)

M. Marks: 200
Theory: 100
Practical: 100

Section - I

Therapeutic Exercises

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.
2. Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.
3. **Joint Mobility** – Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.
4. **Muscle Insufficiency** – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.
5. **Neuromuscular Inco-ordination** – Review normal neuromuscular coordination, Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.
6. **Functional re-education** – General therapeutic techniques to re-educate ADL function.

Section – II

Posture, Balance, Gait:

1. Normal Posture – Overview of the mechanism of normal posture.
2. Abnormal Posture – Assessment, Types, etiogenesis, management, including therapeutic exercises.
3. Static and Dynamic Balance – Assessment & management including therapeutic exercises.
4. Gait – Overview of normal gait & its components.
5. Gait deviations - Assessment, Types, etiogenesis, management, including therapeutic exercises.
6. Types of walking aids, indications, effects & various training techniques

Section – III

Hydrotherapy:

1. Basic principles of fluid mechanics, as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle Strengthening & wound care etc.
3. Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation.

Section – IV

Special Techniques:

1. Introduction to special mobilization & manipulation techniques, effects, indications & contraindications
2. Conceptual framework, principle of Proprioceptive Neuromuscular Facilitation (PNF) techniques, including indications, therapeutic effects and precautions.
3. Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions.
4. Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
5. Group Therapy – Types, advantages & disadvantages.

Exercise Therapy – II (Practical)

1. To practice assessment & evaluative procedures, including motor, sensory, Neuromotor coordination, vital capacity, limb length & higher functions.
2. To study & practice the various techniques of mobilization of joints region wise.
3. To study & practice the various techniques of progressive strengthening exercises of muscles region wise.
4. To study & practice the use of various ambulation aids in gait training.
5. To assess & evaluate ADL's and practice various training techniques.
6. To study & practice Mat Exercises.
7. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
8. To assess & evaluate equilibrium / balance & practice various techniques to improve balance.
9. To study the structure & functions of hydrotherapy equipments & their applications.
10. To study & practice various traction techniques, including manual, mechanical & electrical procedures.
11. To study & practice various group exercise therapies.

Electrotherapy (Part II)

M. Marks: 200

Theory: 100

Practical: 100

Section – I

1. Review of Neuro muscular Physiology including effects of electrical stimulation.
2. Physiological responses to heat gain or loss on various tissues of the body.
3. Therapeutic effects of heat, cold and electrical currents.
4. Physical principles of Electro – magnetic radiation.
5. Physics of sound including characteristics and propagation.

Section – II

1. **High frequency currents (Short Wave Diathermy and Micro Wave Diathermy)** - Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **Medium frequency currents (Interferential Therapy and Russian Current)** - Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
3. **High frequency sound waves (Ultrasound)** - Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

Section – III

1. **Therapeutic light in Physiotherapy (LASER)** – Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **Therapeutic mechanical pressure (Intermittent compression therapy)** – Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation.
3. **Extracorporeal Shock Wave Therapy:** Principles, Effects and Uses, Indications, Contraindications, Precautions and preparation of the patient

Section – IV

1. **Electro – diagnosis** – Instrumentation, definition & basic techniques of E.M.G. and Nerve Conduction Velocity Studies
2. **Bio–feedback** – Instrumentation, principles, therapeutic effects, indications, contraindications, limitations, precautions, operational skills and patient preparation.

Electrotherapy – II (Practical)

1. To study a Short Wave Diathermy unit, its operation and different methods of application – region wise.
2. To study a Micro Wave Diathermy unit, its operation unit, its operation and different methods of application – region wise.
3. To study an Ultrasound unit, its operation and different methods of application – region wise.
4. To study a Laser unit, its operation and different methods of application – region wise.
5. To study an Interferential therapy unit, its operation and different methods of application – region wise.

Orthopedics

M. Marks: 200

Theory: 100

Practical: 100

1. Introduction to Orthopaedics: Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.

2. Principles of operative treatment: List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.

3. Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer’s Elbow, Dequervain’s disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fascitis etc.

4. Sports Injuries: Injuries related to common sports their classification and management.

5. Fractures and Dislocations: General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including: Fracture – disease, Volkmann’s Ischemic Contracture, Sudeck’s Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.

6. Upper Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

7. Lower Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

8. Spinal Fractures and Dislocations: Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

9. Recurrent Dislocations: Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

10. Amputations

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

11. Bone & Joint Infections: Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

12. Bone Joint Tumors: Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma)

13. Chronic Arthritis: Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

14. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

15. Spinal and Other Deformities: Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

16. Poliomyelitis: Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery

17. Congenital Deformities: Outline the clinical features and management of Congenital Talipes Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogryphosis multiplex congenita and Osteogenesis imperfecta

18. Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of:

- a) Radial, median and ulnar nerve lesions.
- b) Sciatic and lateral popliteal lesions.
- c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand

19. Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

20. Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

General Surgery Including Cardio thoracic Surgery, Plastic Surgery, Obstetrics and Gynecology

M. Marks: 200

Theory: 100

Practical: 100

General Surgery

1. Principles of General Surgery and Anesthesia including blood transfusion and physiological response of the body to surgery
2. Pre and Post Operative complications and their management
3. Wounds: - Wound Infections, Sinuses and Ulcers. Burns- Different degrees. Complications of Burn specially post burn contractures, Tetanus, Gangrene and gas gangrene
4. Outline of Abdominal surgery, Post-Operative complications and management in- Appendisectomy, Herniorraphy, Mastectomy, Thyroidectomy, Colostomy, Cholecystectomy, Ileostomy
5. Role of Physiotherapy in General Surgery

Cardio Thoracic Surgery

Incisions for cardiothoracic surgery, General Pre and Post-Operative Physiotherapeutic Management patients of cardiothoracic surgery, various surgical procedures for chest and cardiac condition/disease

Plastic Surgery

1. Burn- Degrees of burn, General management of burn, Reconstructive surgery following burn and complications of burn
2. Types of Skin Grafts and Flaps
3. Principles of Tendon transfer
4. Surgery of hand with emphasis on reconstructive surgery in Trauma and in Leprosy

Obstetrics & Gynecology

1. Anatomy of Pelvic organs mechanism, physiology of pelvic floor, Sphincter muscles, Menstrual cycle, and its disorders, other hormonal disorders of females, Obesity and female hormones
2. Pregnancy and its stages, labour, stages of labour, delivery, Caesarian Section, Cancer of female reproductive organs, STD in females
3. Menopausal effects in emotion and musculo-skeletal system
4. Maternal physiology in pregnancy
5. Child birth complications, complication of multiple child birth, methods of birth control-Merits and Demerits
6. Hysterectomy

General Medicine and Cardio thoracic condition and Pediatrics

M. Marks: 200

Theory: 100

Practical: 100

General Medicine

Each disease to be discussed under the following headings:-

- Definition
- Aetio-pathogenesis.
- Pathology
- Clinical Features
- Diagnosis
- Differential Diagnosis
- Principles of Management including physiotherapeutic management

Broad Topics:

1. Introduction of Medicine
2. General principles of assessment and management including physiotherapeutic management. Elementary idea about use of laboratory and imaging techniques
3. Diseases of Respiratory System
Approach to a patient with Respiratory Disease , Chronic Obstructive Pulmonary Disease. Bronchial Asthma, Pneumonia, Lung Abscess, Bronchiectasis, Pleural Effusion & Empyema Pneumothorax, Pulmonary tuberculosis, Respiratory Failure, Interstitial Lung Disease Pulmonary Embolism
4. Diseases of GI system & Hepato-Biliary Disorders
Peptic Ulcer Disease, Malabsorption Syndrome, Inflammatory Bowel Disease, Approach to a patients of G.I.S.Disease, Upper G.I.S. bleed, Jaundice , Viral Hepatitis, Cirrhosis of Liver Acute Pancreatitis
5. Diseases of Kidney
Approach to a patient of Renal Disease, Glomerulo Nephritis, Acute Renal Failure , Chronic Renal Failure, Dialysis, Nephrotic Syndrome, Urinary Tract Infections
6. Hematological Disease
Approach to a. patient with hematological disease, Anemia & its different types, Leukemia Haemophilia, Haemoglobinopathies, Purpura, Oncology- Lymphomas, Lung Carcinoma
7. Endocrine & Metabolic Diseases
Acromegaly, Gigantism & Dwarfism, Diabetes Insipidus, Hypothyroidism, Hyperthyroidism Adrenal hypo-function & hyper function, Diabetes Mellitus, Diabetic Neuropathy, Diabetic Foot Hypoglycemia, Vit-D, Calcium metabolism & Parathyroid Gland Disorders, Lipid Disorders
8. Nutritional Diseases
Obesity, Protein Energy Malnutrition, Common Vitamin Deficiencies
9. Connective Tissue Diseases
Approach to a patient with Connective Tissue Disease, Rheumatoid Arthritis, Gout, Vasculitides
10. Infectious Diseases
Malaria, Filaria, Tetanus, Kala-azar, Typhoid Fever, HIV& AIDS , Diarrhoeal Diseases

11. Diseases due to Environmental factors & Poisons

Heat Stroke , Radiation Injury, Snake Bite , General principles of management of poisoning
Organo-Phosphorus Poisoning, Sedative and hypnotic poisoning

Cardiology

1. Basic Anatomy of Heart, Coronary circulation.
2. Normal Cardiac contraction and relaxation mechanism
3. Acute Rheumatic Fever, Etiology, Clinical features and Assessment
4. Valvular Heart Diseases like Mitral Stenosis, Mitral Regurgitation, Aortic Stenosis, Aortic Regurgitation- Clinical features and assessment
5. Ischemic Heart Disease- Clinical features and assessment
6. Hypertension- Types and management
7. Congestive Heart Failure
8. Peripheral Vascular Disease & Deep Vein thrombosis
9. Common Cardiac Arrhythmias

Pediatrics

1. Growth and development of a child from birth to 12 yrs of age indicating physical and adaptive developments.
2. Maternal and neonatal factors contributing to high-risk pregnancy.
3. Neonatal and Maternal infections.
4. Maternal heart diseases, renal failure, tuberculosis, diabetes etc.
5. Community Health Program like PPP; Blindness; Deafness and immunization Schedule.
6. Cerebral Palsy- Definition, Outline of etiology of prenatal, perinatal and postnatal causes. classification, clinical features and assessment based on musculo skeletal system. Outline of associated defects like mental retardation, microcephaly, hearing and speech impairment, squint and convulsion.
7. Muscular Dystrophy- Various forms mode of inheritance, clinical manifestations and its management physiotherapeutic ally.
8. Spina Bifida, Meningo myelocele- Outline of development clinical manifestations, bladder bowel control, hydrocephalus
9. Stills Disease- classification, pathology in brief, physical findings, course and prognosis. Prevention and correction of deformity
10. Acute CNS infection- Classification, clinical findings, sequel leading to mental retardation, blind ness, deafness speech defect, motor paralysis, bladder and bowel problems, seizure disorders feeding difficulties and pressure sores.
11. Normal diet for newborn and child, dietary calorie, fat, protein, minerals and vitamins requirements in normal child as well as in malnitrated child.
12. Lung Infections- Outline of clinical finding complications of bronchitis's lung abscess, bronchial asthma, cystic fibrosis) primary complex in infants and children
13. Acute pediatric distress syndrome, neonatological & pediatric surgical care.
14. Neonatal and pediatric cardiovascular problems.

Neurology and Neuro-Surgery

M. Marks: 200
Theory: 100
Practical: 100

Neurology

1. General Principles of neurological assessment.
2. Cerebro-vascular disease, Hemiplegia
3. Acute infections of CNS – Encephalitis, Meningitis and Poliomyelitis
4. Traumatic Injury of Head & Spine, Paraplegia
5. Parkinsonism and other Extra-pyramidal disorders, Involuntary movements
6. Multiple Sclerosis and other Demyelinating diseases
7. ALS (Amyotrophic Lateral Sclerosis) & Other Motor Neuron disease
8. Disease/injury of peripheral nerves, cranial nerves & G.B.Syndrome
9. Myasthenia Gravis
10. Diseases of muscles like Polymyositis Muscular Dystrophy
11. Dementia, Alzheimers disease
12. Cerebral Palsy
13. Cervical & Lumbar Spondylosis and Disc Prolapse
14. Intracranial Tumors

Neuro-Surgery

1. Principles of Management of Cranial & Spinal trauma
2. Orientation about Neuro-Surgical Intensive care
3. Physiotherapeutic approach to Neurologically Disabled patients
4. Outline of clinical presentation of Brain Tumors & Spinal Cord Compression
5. Elementary idea about minimal invasive surgery in Neurosurgical perspective
6. Developmental anomalies of CNS
7. Patho-physiology of peripheral nerve injury & its principles of management
8. Degenerative diseases of spine & its physiotherapeutic management
9. Physiotherapeutic management of Pain Syndrome

Physical/ Functional Assessment

M. Marks: 200
Theory: 100
Practical: 100

A.

1. Problem oriented Medical Record-History, Concept & Advantages
2. Communication with patient-Principle and methods and types

B. Physical approach on the basis of functional Assessment

(a) Musculo-skeletal system

1. Maitland's Concept
2. Cyriax Approach
3. McKenzie Concept
4. Neural Tension Test - normal & abnormal findings

(b) Neuro-Muscular System (for Central Nervous System Problems)

1. Bobath approach
2. Motor Relearning Process

(c) Clinical decision-making

(d) Rationale of plan of Physiotherapeutic Management

(e) Special orthopaedic tests commonly used in the clinical setting

Physiotherapy in Orthopaedics

M. Marks: 200

Theory: 100

Practical: 100

1. Introduction to Orthopaedics: Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.

2. Principles of operative treatment: List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.

3. Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer's Elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fasciitis etc.

4. Sports Injuries: Injuries related to common sports their classification and management.

5. Fractures and Dislocations: General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including: Fracture – disease, Volkmann's Ischemic Contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.

6. Upper Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

7. Lower Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

8. Spinal Fractures and Dislocations: Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

9. Recurrent Dislocations: Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

10. Amputations

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

11. Bone & Joint Infections: Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

12. Bone Joint Tumors: Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma)

13. Chronic Arthritis: Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

14. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

15. Spinal and Other Deformities: Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

16. Poliomyelitis: Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery

17. Congenital Deformities: Outline the clinical features and management of Congenital Talipes Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogryphosis multiplex congenita and Osteogenesis imperfecta

18. Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of:

- a) Radial, median and ulnar nerve lesions.
- b) Sciatic and lateral popliteal lesions.
- c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand

19. Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

20. Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

Brief review of the above conditions and various physiotherapeutic modalities, aim, means and techniques of physiotherapy should be taught in detail.

Physiotherapy in Neurology and Neurosurgery

M. Marks: 200

Theory: 100

Practical: 100

Introduction:

Brief review of the following neurological conditions and various modalities of physiotherapy, aims, means and technique of physiotherapy should be taught.

Neurology

- Hemiplegia
- Cerebral palsy
- Tetraplegic Syndrome
- Multiple Sclerosis
- Tabes Dorsalis
- Transverse Myelitis
- Polio Myelitis
- Parkinson's Disease
- Motor Neuron Disease
- Poly Neuritis Ataxia
- Extra Pyramidal Lesion
- Peripheral Neuropathy
- Peripheral Nerve Injuries
- Sciatica
- Brachial Neuritis and Neuralgia
- Facial Palsy and Bell's Palsy
- Syringomyelia
- Monoplegia
- Myopathy and Muscular Dystrophy
- Sub-acute Combined Degeneration of Spinal Cord
- General and Physiotherapeutic management of Psychiatric Patients

Neuro-Surgery

- Pre and Post operative physiotherapeutic management of Neuro- Surgical conditions and complications
- Peripheral Nerve Injuries
- Pre and Post operative physiotherapeutic management of Nerve Repair / Grafting.
- P. T. in Head Injury, Laminectomy, Surgery following Brain Tumour and Craniotomy etc.

P.T. in Surgery Including Gynecology and Obstetrics

M. Marks: 200

Theory: 100

Practical: 100

Brief review of the following surgical conditions and various physiotherapeutic modalities, aims, means and techniques of physiotherapy should be taught.

Abdominal Surgery & Others

Pre and Post Operative Physiotherapy management of following abdominal surgical conditions including incisions, pre and postoperative complications

- Total Gastrectomy, Partial Gastrectomy
- Appendisectomy
- Cholecystectomy
- Colostomy
- Herniorraphy
- Nephrectomy
- Radical Mastectomy

Cardio thoracic Surgery:

Introduction:- Incisions for cardio thoracic surgery, Drainage tubes & bottles, Ventilators- uses and functions, Physiotherapy during ventilator.

Pre and Post Operative physiotherapy management of following conditions.

- Thoracotomy
- Lobectomy
- Thoracoplasty
- Pneumonectomy

Orientation about atelectasis, pneumothorax, pre and post operative physiotherapy management of cardiac surgery, open-heart surgery

Plastic Surgery:

- Burn & its classification Physiotherapy management.
- Pre and Postoperative physiotherapy of skin grafting
- Physiotherapy of cases after reconstructive surgery of hand.
- Various physiotherapy modalities and treatment techniques for the above mentioned conditions

Obstetrics & Gynecology:

Brief review of the following surgical conditions and various physiotherapeutic modalities, aims, means and techniques of physiotherapy should be taught

7. Hysterectomy
8. Prolapsed Uterus
9. Antenatal and postnatal care
10. Pregnancy and its stages, labor, stages of labor, delivery, Caesarian Section, Diastasis Recti etc
11. Child birth complications, complication of multiple child birth

Physiotherapy in General Medicine including Paediatrics

M. Marks: 200
Theory: 100
Practical: 100

A. General Medicine

Review of the Pathological and principles of management by Physiotherapy to the following conditions:

1. **Inflammation** – acute, chronic
2. **Oedema** – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia
3. **Arthritis and Allied Conditions (in details):**
 - a) Osteo – arthritis – generalised, Degenerative and traumatic, Spondylosis and disorders.
 - b) Rheumatoid Arthritis, Still's disease, infective Arthritis.
 - c) Spondylitis, Ankylosing Spondylitis.
 - d) Nonarticular Rheumatism – Fibrositis, Myalgia, bursitis, Periarthritis etc.
4. **Common conditions of Skin** – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually transmitted diseases.
5. **Deficiency diseases** – Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy
6. **Psychiatric Disorders** – Psychosis, Psychoneurosis, Senile dementia.

B. Respiratory Diseases

- 1) Review of mechanism of normal respiration.
- 2) Chest examination, including auscultation, percussion.
- 3) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various respiratory disorders.

Review of pathological changes and principle of management by physiotherapy of the following conditions:

- 1) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD.
- 2) Pleurisy and Empyema, Pneumonia
- 3) Bacterial Disease
- 4) Rheumatic fever, Carcinoma of respiratory tract
- 5) Paralysis of diaphragm & vocal cords
- 6) Chest wall deformities.

C. Cardiovascular Diseases

- 1) Review of anatomy & physiology of the cardiovascular system.
- 2) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various cardiovascular disorders.
- 3) Review of pathological changes and principle of management by physiotherapy of the following conditions:

Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure, Hypertension, Hypotension, Aneurysm

D. Pediatrics

Growth and development- Maternal and neonatal fracture contributing to high risk baby, CP, Myopathy, Spinabifida, Still's disease, Acute CNS infection, Lung infection, CTEV, CDH, Erb's palsy and arthrogryphosis multiplex congenita

Disability Prevention and Rehabilitation

M. Marks: 200

Theory: 100

Practical: 100

1. Introduction
2. Definition concerned in the phases of disability process, explanation of its aims & principles, Scope of rehabilitation, (Impairment, Disability, Handicap)
3. Definition concerned with the causes of Impairment Functional limitation and Disability
4. Disability Prevention. Limitation & Rehabilitation.
5. Present Rehabilitation Services
6. Legislations for rehabilitation services for the Disabled, P.W.D.Act / Compensations and benefits available for disabled
7. Rehabilitation Team & its members, their role.
8. Contribution of Social Worker towards rehabilitation
9. Vocational evaluation & Goals for disabled, role of Vocational Counselor.
10. Principles of Communication & its problems: -
 - Speech Production
 - Communication disorders secondary to Brain Damage.
 - Aphasia & its treatment.
 - Evaluating Language.
 - Disarthria & its treatment
 - Non-Aphasic language disorders
11. Architectural barriers possible modifications in relation to different disabled conditions – namely Hemiplegia, Paraplegia, Amputees, Cerebral Palsy etc.
12. Community Health:
 - a. Introduction to community Health, Definition of Community and Health, Health Determinants
 - b. Community and Rehabilitation – Definition, Concepts and Team , Community Health in relation to rural and urban health setup
 - c. Community based rehabilitation Vs Institutional based rehabilitation – Merits and demerits
 - d. Community Resources in rural and urban set up
 - e. Rehabilitation – Team work, members, their duties and responsibilities
13. Prostheses and Orthoses
 - Definition and Basic Principles
 - Designing and Construction of Upper & Lower extremity Orthosis & Spinal Orthosis.
 - Upper Extremity prosthesis: Prescription, fitting and checking
 - Lower. Extremity prosthesis: Prescription, fitting and checking
 - Prescription and design of footwear- & its modification.
 - Wheel Chairs.
 - Design and construction of adoptive devices
 - Classification of Aids & Appliances
 - Ambulatory Aids & Assistive Devices
 - Measurement and P.O.P. cast techniques.
 - Simple splint techniques
 - Low cost thermo-labile material for construction of Orthosis.
 - Practical demonstration of orthoses /prostheses /mobility aids & assistive aids.
14. Professional Ethics
 - Implications of and confirmation to the rules of professional conduct