



All India Institute of Medical Sciences, Jodhpur

Indicative Syllabus for the Post of Multi Rehabilitation Worker (Physiotherapist)

(Syllabus is only indicative. The questions can assess any aspect of knowledge, aptitude, attitude and practical skills, which is expected from a trained person to work efficiently at the advertised post)

Section A

40% Questions covering the following topics:-

General Intelligence & Reasoning: It would include questions of non-verbal type.

The test will include questions on:-

- Similarities and differences,
- Space visualization,
- Problem solving,
- Analysis,
- Judgment,
- Decision making,
- Visual memory,
- Discriminating observation,
- Relationship concepts,
- Figure classification,
- Arithmetical number series,
- Non-verbal series etc.

The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

Quantitative Aptitude: This paper will include questions on problems relating to:-

- Number Systems,
- Computation of Whole Numbers,
- Decimals
- Fractions
- Relationship between Numbers,
- Fundamental arithmetical operations,
- Percentages,
- Ratio and Proportion,
- Averages,
- Interest,
- Profit and Loss,
- Discount,
- Use of Tables and Graphs,
- Mensuration,
- Time and Distance,
- Ratio and Time,
- Time and Work, etc.



Computer Knowledge: Candidates' understanding of the Basics of Computer Knowledge, its parts, functions, emails, MS office, etc.

Section B (SUBJECT KNOWLEDGE)

60% Questions to be based on the subject specific to the post with following topics:-

ANATOMY

GENERAL ANATOMY

Cell- (parts, names of cytoplasm organelles and inclusion with their function.)

Epithelium- types with example and light microscopic structure

Connective tissue- classification with emphasis to tendon

Cartilage- types with example

Bone -types with example, types of ossification (stages are not required) Blood supply fracture repair

Joints- classification with example, emphasis to synovial joint

Muscles- types (DETAILS OF EM NOT REQUIRED)

Nervous tissue- structure of neuron, synapse reflex arc, degeneration and regeneration of nerve.

Embryology -

- Ovum, spermatozoa, fertilization of the germ layers and the derivations
- Development of skin, fascia, blood vessels, lymphatic's
- Development of bones axial and appendicular skeletal and muscles
- Neural tube, brain vessels and spinal cord
- Development of brain (brain stem) structures

REGIONAL ANATOMY

SUPERIOR EXTREMITY

Theory

Axilla, brachial plexus, shoulder joint, sterno clavicular joint, axillary lymph nodes, elbow joint, superior radio ulnar joint, nerves of arm and forearm, synovial bursa of hand and palmar space, ulnar nerve in hand, cutaneous distribution according to dermatomes, clinical anatomy, surface anatomy.

Practical/demonstration

Pectoral region, axilla, scapula and clavicle, humerus, muscles of arm (front and back), radius, front of forearm, ulna, back of forearm, muscles of palm and arterial arches, articulated hand (carpals and metacarpals names and arrangement in order only)



INFERIOR EXTRIMITY

Theory

Lumber plexus, inguinal group of lymph nodes, hip joint femoral triangle and femoral sheath, knee joint, venous drainage of inferior extremity, sciatic nerve and its distribution, obturator nerve, arches of foot, mid tarsal and sub talar joint, cutaneous distribution according to myotome, clinical anatomy, surface markings.

Practical/ demonstration

Hip bone, glutei muscles, femur, front of thigh, back of thigh, medial side of thigh, tibia, anterior compartment of leg, fibula, lateral compartment of leg, back of leg, articulated foot (identification of tarsal and meta tarsal only)

ABDOMEN AND PELVIS

Theory

Abdominal wall, inguinal canal, stomach, liver, pancreas, kidney with ureter and spleen, small intestine, large intestine, abdominal aorta, portal vein, diaphragm, sacral plexus, sacro-iliac joint, intervertebral disc.

Practical/ demonstration

Abdominal viscera, sacrum, bony pelvis, viscera of pelvis and blood vessels.

THORAX

Theory

Thoracic cage and mediastinum, heart with its internal and external features, blood vessels, typical spinal nerve, typical intercostals space, mechanism of respiration, surface markings of heart and lungs.

Practical/ demonstration

Superior mediastinal structures, sternum, ribs (only general features), vertebrae (identification, general features, functional components, development, vertebral column with weight transmission), heart, pleura & lungs.

HEAD AND NECK

Theory

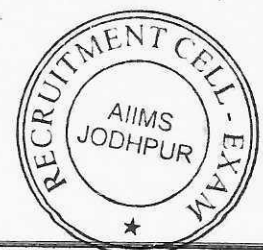
Temporo-mandibular joint, atlanto-occipital and atlano-axial joint, cutaneous distribution of trigeminal nerve.

Practical/ demonstration

Mouth cavity, nasal cavity, pharynx and larynx (parts , sensory distribution), cranial bones(identification of individual bone general features, different foramina in relation to cranial nerve, cranial fossae and their relations to brain and hypophysis.)

Identification of Anterior and Posterior triangles of Neck with their contents.

Radiological Anatomy of musculo Skeleton system



NERVOUS SYSTEM

Theory

General introduction and classification, Autonomic Nervous system (Idea about Sympathetic and Para Sympathetic with their difference in distribution and function.)

Spinal cord with its Meanings, spinal reflex, Pyramidal and Extra pyramidal tracts (Details nucleus not required) Blood supply.

Parts of brain, meanings, Gross discussion of Hind Brain, Mid Brain (cranial Nerve Nucleus position should be mentioned)

Fore brain- Cerebral hemisphere, functional area and blood supply.

Practical /demonstration

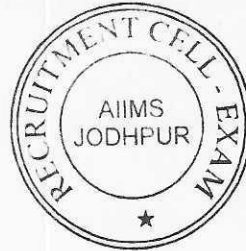
Spinal cord and parts of brain.

CRANIAL NERVES

Names in order individual cranial nerve distribution idea about upper motor neuron and lower motor neuron apply anatomy

HISTOLOGY PRACTICAL

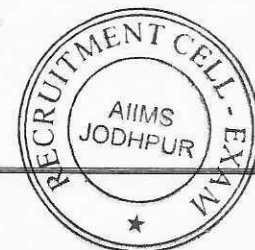
1. Epithelium (simple, compound)
2. Connectivity tissue (cartilage and bone)
3. Muscle (smooth and skeletal)
4. Nervous tissue (neuron)
5. Blood vessels (Large artery and vein)



PHYSIOLOGY

GENERAL PHYSIOLOGY

1. Introduction and scope of physiology.
2. Cell and tissue- its structure, principal constituents, properties and function including cell division.
3. Body fluid :
Blood: composition and general functions of plasma. Blood cells-structure and function- red blood cells, white blood cells- including number and approximate length of life – position, structure and function of cells of reticulo endothelial system.
Blood clotting including bleeding time and clotting time, factor accelerating or slowing the process. Blood group and their significance, Rh-factor, hemoglobin and ESR
Formation of blood, tissue fluid and lymph.
4. Cardio vascular system:
 - Structure and properties of heart, muscle and nerve supply of heart.
 - Structure and function of arteries, capillaries and veins.
 - Cardiac cycle and heart sound
 - Cardiac output measurements, factor affecting heart rate and its regulation, cardio vascular reflexes.
 - Blood pressure, its regulation, physiological variations, peripheral resistance, factor controlling BP, hemorrhage.
 - ECG studies and stress test.
5. Respiratory system:
 - Mechanism of respiration, changes in diameter of thorax- inter-pleural and intra-pulmonary pressure.
 - Quantities of lung volumes, tidal and residual volume, vital capacity.
 - Gaseous inter change in lungs and tissue.
 - Control of respiration- nervous and chemical significance of changes in rate and depth transportation of oxygen and carbon dioxide.
 - Respiratory states- anoxia, asphyxia, cyanosis acclimatization.
6. Digestive system:
 - General arrangement of alimentary canal, liver pancreas position, structure and function.
 - Nutrition and diet- carbohydrates, protein, fat, salts, water, vitamins and mineral digestion, absorption and metabolism.
7. Reproductive system:
Sex determination and development of puberty, male sex hormones, spermatogenesis, female sex hormones, menstrual cycle, ovulation, pregnancy, function of placenta and lactation.



8. Excretory system: Gross and minute structure of kidney, renal circulation, mechanism of formation of urine, glomerular filtration rate and tubular function, renal function and renal test, physiology of maturation.
9. Endocrine system:
 - Structure and function of pituitary glands (anterior and posterior). Thyroid, Parathyroid, adrenal cortex, adrenal medulla, thymus and pancreas.
10. Skin:
 - structure and function.

NEUROMUSCULAR PHYSIOLOGY

1. Cell membrane- ionic and potential gradient and transport.
2. Muscle- types of muscular tissue- gross and microscopic structures- function. Basis of muscle contraction- changes in muscle contraction, electrical- biphasic and monophasic action potential, chemical, thermal and physical changes, isometric and isotonic contraction.
 - a) Motor units and its properties- clones, tetanus, all or none law, fatigue.
 - b) Nerve- gross and microscopic structure of nervous tissue, one neuron- generation of action potential –nerve impulse –condition
Neuromuscular junction.
 - c) Degeneration- regeneration of peripheral nerves, wallerian degeneration, electro tonus and pflagers law.
 - d) Types and properties of receptors, types of sensations, synapse, reflex arc, its properties occlusion, summation, sub minimal fatigue etc.
 - e) Tracts- ascending and descending and extra pyramidal tracts
 - f) Functions of EEG
 - g) Functions of cerebral cortex, cerebrum, cerebellum, basal ganglia, thalamus- connection and functions.
 - h) Reticular formation- tone, posture and equilibrium. Autonomic nervous system.
 - i) Special senses Eye -errors of refraction, lesions of visual pathways.
 - j) Speech and its disorders
 - k) Ear and vestibular apparatus, taste, olfactory, somatic sensations.



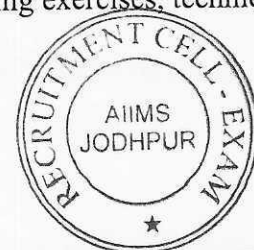
BIO-CHEMISTRY

1. **BIO-PHYSICS:** 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. **CARBOHYDRATES, LIPIDS & PROTEINS & METABOLISM:** Definition, functions, sources, classification and metabolism
4. **VITAMINS:** Classification, fat soluble vitamins A D E K, water soluble vitamin-B complex and vitamin 'C', Daily requirement physiological functions and disease of vitamin deficiency.
5. **BIOENERGETICS:** Concept of free energy change, Energetic reaction and endogenic reactions, Concepts regarding energy rich compounds, Respiratory chain and Biological oxidation.
6. **WATER AND ELECTROLYTES:** Fluid compartments, Daily intake and output, Dehydration, sodium and potassium Metabolism.
7. **MINERAL METABOLISM:** Iron ,Calcium,Phosphorus,Trace elements
8. **NUTRITION:** Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, Metabolism in exercise and injury, Diet for chronically ill and terminally ill patients.
9. **CONNECTIVE TISSUE:** Mucopolysaccharides, Connective tissue proteins, Glyco-proteins, Chemistry and Metabolism of bone and teeth.
10. **NERVE TISSUE:** Composition, Metabolism, Chemical mediators of nerve activities.
11. **MUSCLE TISSUE:** Structure, Metabolism of muscles, Muscle contraction.
12. **HARMONES:** General Characteristics and Mechanism of Hormone actions



EXERCISE THERAPY -1

1. Basic physics in exercise therapy, mechanics- force, gravity, line of gravity, center of gravity, center of gravity in human body, base, equilibrium, axis and planes, mechanical principles of lever, order of lever, example in human body, pendulum, spring.
2. Massage: definition of massage, types, general effects and uses, local effects of individual manipulation (physiological effects), contraindications, technique of application of all manipulations-stroking, effleularge, kneading and picking up, skin rolling (back), clapping, tapping, friction etc.
3. Suspension therapy: principles of suspension, types, effects and uses, their application either to mobilize a joint to increase joint range of motion or to increase muscle power – explaining the full details of components used for suspension therapy.
4. Introduction to exercise therapy
5. Starting positions-Fundamental starting positions-standing, sitting, kneeling, lying and-hanging. All the derived positions of the above five fundamental starting positions.
6. Classification of movements in details:
Active-Voluntary in definition involuntary movements; Passive movements.
7. Voluntary movements: Free exercise, assisted exercises, resisted exercise, Active Assisted and Resisted exercise.
8. Assisted Exercises: Technique and uses.
9. Free exercises-Classification, technique, "effects of frequent exercises on various systems etc.
10. Resisted exercises- Techniques and types of resistance, SET system (Heavy resisted exercises, Oxford method, De Lorme method, Mc queen method.
11. Relaxed passive movements, basic knowledge of classification of relaxed passive movements, definition, technique, effects and uses of relaxed passive movement.
12. Muscles strength: Anatomy and physiology of muscle tissue causes of muscle weakness paralysis, prevention of muscle weakness/paralysis Types of muscle work and contraction ranges of muscle work, prevention of muscle atrophy
Muscle assessment M.R.C grading Principles of muscle strengthening/re-education, early re-education of a paralyzed muscle etc.
13. Joint Movement: Classification of joint movements causes of restriction of joint movement, prevention of restriction of joint range of motion, etc. Principles of mobilization of a point in increasing its range of motion Technique of mobilization of a stiffjoint, Goniometry.
14. Bed Rest-Its necessity & Complications.
15. Posture: Types, factors responsible for good posture, factors for poor posture, principles of development of good posture.
16. Breathing exercises: Physiology of respiration, types of breathing exercises, techniques of various types of breathing exercises, its effects and uses.

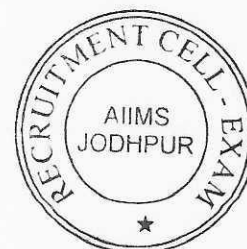


17. Hydrotherapy: Introduction, various types of hydrotherapy units, construction and equipments used in hydrotherapy Principles, indications, contraindication, effects and uses of hydrotherapy, Precautions towards patient, towards therapist, equipment unit etc.



ELECTROTHERAPY -I

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- electrical potentials generated by cell-Ohms Law, Joule's Law.
2. **Magnetic energy**- Nature and property of magnet, electromagnetic induction. Principle of working of choke coil -transformer-rectification of A.C to DC. Metal Oxide Rectifier, Semiconductor- 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. Wiring of components in series and parallel distribution of electrical energy-Earth Shock and Electrical shock Safety Devices
5. **Principles of LOW FREQUENCY CURRENTS**: Nature and principles of production of muscle Stimulating current-Types of Low frequency Currents use for treatment. High Voltage Galvanic current, rectifying current.
6. **Principles of electro diagnosis**-strength duration Curve-chronaxie and Rheobase-Their relationship etc
7. **Medium frequency Current**: Definition, Production (brief) Physiological effects and therapeutic effects of interferential current, Russian current.
8. **Actino Therapy** Definition, Production (brief) Physiological &Therapeutic effect of the following Infra radiation, laser, Ultraviolet radiation.
9. **Therapeutic Heat**: Definition, principles, physiological and therapeutic effects of moist heat, Paraffin Wax bath, Contrast bath, Whirl pool bath, Fluido therapy, Electrical heating pads.
10. **Cryotherapy**: Principle, Physiological effects, Uses cold packs, ice massage, Commercial Cold Packs. Ice Towels, Cold compression unit, Evaporating Sprays.
11. **Traction**



PATHOLOGY, MICRO BIOLOGY

1. Aims and objectives of study of Pathology.
2. Brief outline of cell injury, degeneration, necrosis and gangrene,
3. Inflammation: Definition, vascular and cellular phenomenon difference between Transudate and exudates. Granuloma.
4. Circulatory disturbances: Hemorrhage, Embolism Thrombosis Infarction, shock, Volkmann's ischemic contracture.
5. Blood disorder: Anemia, Bleeding disorder.
6. CVS: heart and blood vessels, Coronary heart disease
7. Respiratory System: Ch. Bronchitis, Asthma Bronchiectasis, Emphysema, COPD etc.
8. Bones and Joint: Arthritis & Spondyloarthropathy
9. PNS and Muscles: Neuropathies, Poliomyelitis & Myopathies etc.
10. CNS: Infection, Demyelinating disease, Degenerative disease etc
11. Neoplasia
12. Growth and its disorders like hypertrophy hyperplasia & atrophy.
13. Autoimmune diseases
14. Healing and repair..
15. Diabetes mellitus and gout.



Microbiology

1. Introduction and History of Microbiology
2. General lectures on Microorganisms (brief)
3. Sterilization and asepsis.
4. Infection- Source of infection and Entry and its Spread-
5. Immunity- Natural and Acquired
6. Allergy and hypersensitivity.
7. Outline of common pathogenic bacteria and diseases produced by them.
8. Respiratory tract infections
9. Meningitis.
10. Enteric infections.
11. Anaerobic infections.
12. Urinary tract infections.
13. Leprosy, tuberculosis and miscellaneous infections.
14. Wound infections.
15. Sexually transmitted diseases.
16. Hospital acquired infections.
17. Virology virus infections, with special mention of Hepatitis.
18. Poliomyelitis & rabies



PHARMACOLOGY

1. **General Pharmacology:** Introduction and definitions, Nature and sources of drugs; Dosage forms of drugs' Routes of drug administration, Pharmacokinetics (Absorption, Bioavailability, Distribution, Metabolism Excretion, First order Zero order Kinetics); Pharmacodynamics (sites and mechanisms of drug action in brief, Adverse drug reactions, Margin of safety of drugs and factors influencing dosage and drug response)
2. **Drugs Affecting ANS:** General Introduction, Drug affecting parasympathetic nervous system, Drugs affecting sympathetic nervous systems,
3. **Drugs Affecting Peripheral (Somatic) nervous System:-** Skeletal Muscle Relaxants, Local Anesthetics.
4. **Renal and CVS :** Diuretics; Renin-angiotension system and its inhibitors, Drug treatment of Hypertension, Angina pectoris, Myocardial infarction Heart failure, and hypercholesterolemia.
5. **Anti-inflammatory drugs and related autacoids:** Histamine, Bradykinin, 5-HT and their antagonists; Prostaglandin's and leukotrienes nonsteroidal Anti-inflammatory drug, Anti rheumatic drugs and drugs used in gout.
6. **Drugs Affecting CNS:** General anesthetics, Anxiolytics and hypnotics; Alcohol, Opioid analgesic Drug dependence and abuse Antiepileptic drugs, Drug therapy for Neurodegenerative disorders.
7. **Endocrines:** Parathyroid hormone, Vitamin D, calcitine and drugs affecting Calcium balance, Thyroid and anti- thyroid drugs; Adrenocortical and anabolic steroids, Insulin and Oral Hypoglycemic agents.
8. **Drugs Affecting Respiratory System:** (Drug therapy of bronchial asthma and chronic obstructive pulmonary disease.
9. **Chemotherapy:**
Introduction, sulfonamides, Fluoroquinolones, Penicillins, 9. Cephalosporins, newer B-lactam antibiotic, aminoglycosides, Macrolides and Newer antibiotics, Tetracycline's Chloramphenicol, Chemotherapy of Tuberculosis and leprosy, antiseptics-disinfectants.
10. **Miscellaneous Topics:** Management of stroke, Toxicology and heavy metal poisoning, special aspects of pediatric and, geriatric pharmacology; Drug interactions with drugs commonly used by physiotherapists; Hematinics, vitamins and antioxidants.

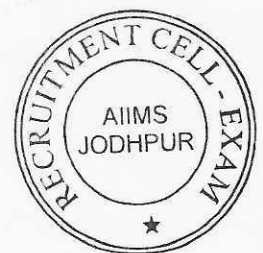


EXERCISE THERAPY- II

1. **P.N.F:** Detail theory of proprioceptive-neuro muscular facilitation techniques Functional re-education and demonstration.
2. **Coordination Exercises:** Definition of coordinated movements, incoordinated movements, Factors for coordinated movements technique of coordination exercises.
3. **Gait:** Analysis of normal gait with muscle work. Various pathological gaits
4. **2 point, 3 point & 4 point gait:** Introduction, crutch measurement, crutch balance, Various types of crutch gait in details.
5. Individual, group and mass exercises, maintenance exercises, plan of exercise-therapy Tables and schemes.
6. Therapeutic exercises impact on physical function.
7. Strategies for effective exercise instruction.
8. Independent learning activities
9. Range of motion & types of ROM exercises
10. Resistance exercises and adaptation of skeletal muscles
11. Principles of aerobic exercises & its physiological response
12. Determinants of exercise program
13. Testing as basis of aerobic program
14. Stretching & its determinants
15. Manual stretching techniques
16. Peripheral joint mobilization techniques
17. Aquatic exercises
18. Application of therapeutic exercises to different regions of body
19. Pulmonary exercises & postural drainage
20. Yoga- Definition-history-Principles-Concepts, General effects of yogic posture on the body.

ELECTROTHERAPY-II

1. Electrophysiology & thermal principles
2. Electrical properties of cell & tissue
3. Tissue repair
4. Sensory & motor nerve activation
5. Pain & role of physical modalities
6. Thermal effect
7. Low energy treatment
8. Stimulative effect
9. Conduction agents of heat & cold.
10. Electromagnetic agents: IRR, Diathermy, Low intensity laser, UV therapy
11. Ultrasound
12. Low frequency current: IFT, TENS
13. Diagnosis & assessment applications: Electrophysiology testing.
14. Wound repair



PSYCHOLOGY

General Psychology

1. Definition of Psychology

- Science of mind, consciousness and behavior
- Scope and branches of Psychology

2. Methods of Introspection, observation and experimentation

3. Hereditary and Environment Relative importance of heredity and environment

Physical characteristics intelligence and personality.

Nature vs. nurture controversy.

4. Learning- Types of Learning:

- Trial and error.
- Classical Learning.
- Instrumental learning.
- Insight for Learning

5. Memory – Steps of memory

- Measurement of memory
- Causes of forgetting
- Concept of STM and LTM

6. Perceptual Process-Nature of perceptual process

Structural and functional factors in perception

Illusion and Hallucination

7. Emotion- Emotion and feeling.

- Physiological changes.
- Theories of emotion (James-Lange and Egnnon-Bird)

8. Motivation- motive; indeed end Drive

Types of motive: Physiological, Psychological and Social.

9. Intelligence- Definitions: theory and assessment

10. Personality: Definition; Types and measurements

11. Child Psychology-

1. Concept of child Psychology:

- A) Meaning; nature, and subject matter of child Psychology
- B) Practical importance of studying child Psychology for rehabilitation professionals

2. Methods of studying child development

- A) Baby Biography
- B) Case History
- C) Behavior rating.



❖ APPLIED PSYCHOLOGY

Section-A: Industrial Psychology

1. Human Engineering:

- Importance of human engineering
- Development of human engineering
- Problems in human engineering

2. Decision Making

- Process and steps in decision making
- Individual decision-making
- Decision making in organization

3. Stress and mental health

- Causes and reaction to stress
- Stress management

4. Work Culture, moral and rewards of work discipline

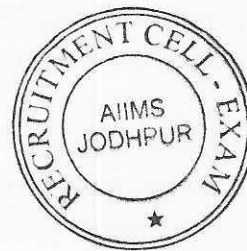
5. Guidance and counseling- Meaning, types and objectives of counselor.

Section -B: Rehabilitation Psychology:

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.

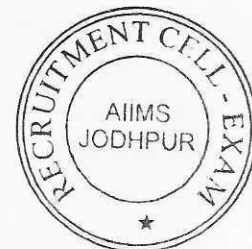
PSYCHIATRY

1. Definition /criteria of Normality and Abnormality and factor contributing to Normal mental health.
2. Neurotic Disorders.
3. Psychotic Disorders.
4. Psychosomatic Disorders.
5. Organic mental disorders.
6. Substances abuse disorders.
7. Problems in adjustment in old age.
8. Psychotherapy
9. Child Psychiatry



COMMUNITY MEDICINE

1. General concepts of health diseases, with reference to natural history of disease with propathogenic and pathogenic phases. The role of socio-economic and cultural environment in health and disease. Epidemiology, definition and scope.
2. Public health administration an overview of the health administration set up at Central and state levels.
3. The national health programme-highlighting the role of social, economic and cultural Factors in the implementation of the national programme,
4. Health problems of vulnerable groups-pregnant and lactating women, infants and preschool children, occupational groups
5. Occupational Health-definition, scope occupational disease prevention of Occupational diseases and hazards.
6. Social security and other measurement for the protection from occupational hazard accident and diseases. Details of compensation acts.
7. Family planning objectives of national family planning programmers and family methods. A general idea of advantage and disadvantages of the methods.
8. Mental health emphasis on community aspects of mental, role of Physiotherapy in mental health problems such as mental retardation etc.
9. Communicable disease- an overall view of communicable disease classified according to principle mode of transmission role of insect and other factors.
10. International health agencies
11. Community medicine and rehabilitation epidemiology, habitat, nutrition, environment anthropology.
 - a. The philosophy and need of rehabilitation.
 - b. Principles of physical medicine
 - c. Basic principles of administration or organization.
12. Introduction to community health.
13. CBR and Institutional based rehabilitation and strategies to intervene in rural health system.
14. CBR in relation to different medical & surgical conditions.



BIOMECHANICS & KINESIOLOGY

1. ESSENTIAL CONCEPTS

- A. Motion and forces , axis and plane , mechanical lever , lever in human body
- B. Force distribution – linear force, resultant force & equilibrium, parallel forces in one plane concurrent force.
- C. Newton's laws – gravity and its effects on human body
- D. Moments
- E. Forces and moments in action
- F. Concepts of static equilibrium and dynamic equilibrium
- G. Composition and resolution of forces
- H. Friction

2. KINEMATIC AL CONCEPTS

3. KINETIC ASPECTS OF LIMB MOVEMENT

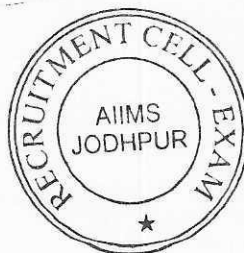
- A. Biomechanics of upper extremity
- B. Scapula-shoulder joint
- C. Elbow joint
- D. Wrist joint & hand
- E. Motion of hip & pelvis
- F. Forces of hip& pelvis
- G. Motion of knee joint
- H. Forces of knee joint
- I. Patella femoral joint
- J. Ankle and foot kinematics
- K. Motion of ankle
- L. Forces of ankle joint
- M. Stability of ankle joint
- N. Temporomandibular joint

4. BIOMECHANICS OF GAIT

- A. Gait cycle
- B. Parameters of human gait
- C. Myokinetics of human gait
- D. Gait deviations
- E. Crutch and cane exercises

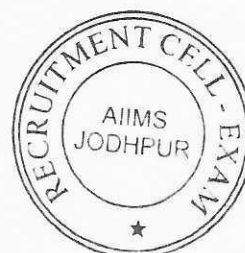
5. POSTURE

- A. Anatomical aspects of posture
- B. Factors affecting posture
- C. Assessment of posture
- D. Types of posture
- E. Postural deviation



ORTHOPAEDIC

1. Fractures dislocations and regional orthopedic disorders in relation to orthopedic management.
2. **Deformities:** Common congenital and acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand and spine. Cervical rib, torticollis, metatarsalgia, claw hand and orthopedic management.
3. Inflammatory conditions and lesions of joints and bones. Osteomyelitis, tuberculosis, Pyogenic infection. Osteoarthritis, T.B. Joints, Tenosynovitis, synovitis, capsulitis, endonitis, Osteoporosis and osteomalacia, sciatica, low back pain brachial neuralgia Rheumatological disorders in detail and orthopedic management & above conditions.
4. Operative Procedures, Amputation Common sites, causes & management, Arthroplasty of Joints, joint replacement (total and partial), Osteotomy
5. Peripheral nerve injuries-their management
6. Trauma and Trauma care
7. Reconstructive surgeries for the rehabilitation of Poliomyelitis, traumatic condition, spine, hand and foot.
8. Principle of Tendon transfer and its procedure.
9. Pediatrics musculo-skeletal conditions and management.
10. Sports injuries and its management.
11. Radiological examination.



SURGERY INCLUDING OBSTEIRICS & GYNAECOLOGY

GENERAL SURGERY

1. Principles of Pre and postoperative management of surgical patients
2. Common pre and post operative complications
3. Surgical intensive care
4. Description of events frequently accompanying in general anesthesia, blood transfusion and physiological response of the body to surgery
5. Abdominal surgery Incisions, complications and management of various abdominal surgeries
6. Wounds, Sinuses and ulcers.
7. Burns. Degrees of burns and, management and reconstructive surgery following burns and complications of Burns

CARDIOTHORACIC SURGERY

1. Incisions for cardiothoracic surgery-General pre and post operative management of cardio-thoracic surgery- Various surgical procedures for various chest and cardiac conditions/ diseases.)

OBS AND GYN

1. Anatomy of pelvic organs mechanism & physiology of pelvic floor sphincter muscles.
2. Pregnancy stage of pregnancy- Labour Stages of labour delivery, Menopause effects in emotions and musculo-skeletal system & common gynecological problems.

PLASTIC SURGERY

1. Principles of cineplasty, tendom transplant, cosmetic surgery, types of grafts, surgery of hand with emphasis on imangement of traumatic and leprosy.



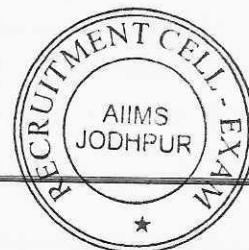
Medicine including pediatrics

I. General Medicine

- a. **Introduction of Medicine,**
- b. **Diseases of Respiratory System** ;Physiology, clinical presentation in relation to Chronic obstructive Pulmonary Disease ,Bronchial asthma, Pneumonia, Bronchiectasis,Pleural effusion & Emphysema thoracis,Pneumothorax
- c. **Diseases of Kidney** ;Physiology, clinical presentation in relation to ARF,CRF
- d. **Hematological Diseases** ;Anemia Physiology, clinical presentation in relation to Hemophilia
- e. **Endocrine & Metabolic Diseases.** ;Vit.D & Calcium metal & parathyroid gland disorders
- f. **Nutritional Diseases** ;Physiology, clinical presentation in relation to Obesity
- g. **Connective Tissue Diseases** ;Physiology, clinical presentation in relation to Rheumatoid arthritis, Gout & other connective tissue disorders
- h. **Infectious Diseases** ;Tetanus ,Leprosy
- i. **HIV&AIDS;**
 - Basic anatomy of heart, Coronary circulation and development of heart
 - Normal cardiac contraction and relaxation: mechanism and diagnosis
 - Physiology, clinical presentation in Ischemic heart disease.
 - Physiology, clinical presentation in Congestive heart failure.
 - Physiology, clinical presentation in Peripheral Vascular disease & Deep vein thrombosis.

PAEDIATRICS

1. Describe growth and development of a child from birth to 12 year including physical, Social, adaptive development.
2. List the maternal and neonatal factors contributing to high risk pregnancy. The neonate: inherited diseases
3. Briefly describe community programmer: International (WHO), national and local For Prevention of poliomyelitis, blindness, deafness, mental retardation, and hypothyroidism. Outline the immunization schedule for children.
4. Cerebral palsy; Define and briefly outline etiology of prenatal, pri-natal and postnatal causes briefly mention pathogenesis, types of cerebral palsy (Classification), findings on examination , general examination of C.N.S, Musculoskeletal and respiratory system. Briefly Outline associated defects: Mental retardation, microcephally, blindness, hearing and speech impairment, squint and convulsions.
Prevention: Appropriate management of high risk pregnancies, prevention of neonatal and postnatal infections, metabolic problems.



5. Muscular Dystrophy: Outline various forms, modes of inheritance and clinical manifestation physical finding in relation to disabilities progression of various forms and prognosis, Describe treatment goals in forms which are and are not fatal.
6. Spina bifida , meningomyelocele: Outline development, clinical features lower limbs, bladder and bowel control, complications UTI & hydrocephalus,
7. Still's disease: Classification, pathology in brief, physical findings, course & prognosis. Outline treatment, prevention and correction of deformity.
8. Acute C.N.S, infections: Classify (Bacterial and viral) and outline the acute illness & Physiology, clinical presentation.
9. Normal diet of new born and child: List dietary calorie, fat, protein, mineral and Vitamin requirement in a normal child and in a child with malnutrition.
10. Lung infections: Physiology, clinical presentation in relation to bronchiectasis, lung abscess and bronchial 'asthma, cystic fibrosis
11. Intensive pediatric care & Physiology, clinical presentation.
12. Cardio respiratory rehabilitation in children.

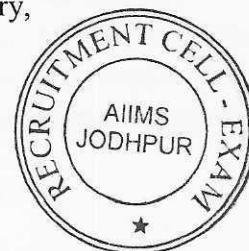
Neurology and Neurosurgery

NEUROLOGY

1. General principles of neurological and neurophysiological and diagnosis.
2. Cerebro- vascular diseases
3. Cerebral vascular accident
4. Acute infections of CNS
5. Parkinsonism and other extra-pyramidal disorder
6. MS & other demylinating diseases;
 - ALS (amyotrophic lateral sclerosis) and other Motor neuron diseases
 - Diseases of Peripheral Nerves, cranial nerves. including peripheral nerve injury.
 - Myasthenia Gravis
 - Diseases of muscles (polymyositis, muscular dystrophy).
 - Cervical and lumbar spondylosis and disc prolapsed.
 - Neuro-surgical Intensive care

NEUROSURGERY

1. Head Injury Causes and mechanism of head injury subdural, epidural and intracranial bleeding, types of neurological, disorders following head injury,
 - Personality disorders , epilepsy
 - Pharmacology of drugs used
 - Management of head injury in acute stage
2. Tumors of neurological system management
3. Cranial & spinal cord legion management
4. Paraplegia , hemiplegia , quadriplegia management



5. Neurogenic bladder – classification – management
6. Pediatric conditions – meningocoele , meningomylocele, spinal tumors
7. Peripheral nerve lesions , management
8. Surgical management of brain disease and CVA

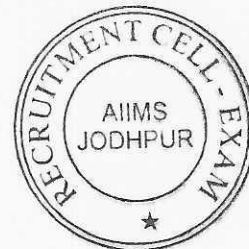
Functional Assessment & Outcome measures

1. Problem oriented Medical Record-History, Concept & Advantages
2. Communication with patient-Principle and methods
3. Importance of outcome measures & assessment in health insurance scenarios
4. Functional Assessment scales & use clinical uses eg, functional independent measure, Sylvian index, PEDI, Gross Motor Function, etc.
5. Outcome measure & quality of life score & its importance e.g. QOL, Health Assessment Questionnaire etc.
6. International Classification of Functions (ICF)



CLINICAL REHABILITATION-I

1. Introduction to Rehabilitation medicine
2. Definition concerned in the phases of disability process, explanation of its aims and principles. Scope of rehabilitation.
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 and P.W.D. Act.
7. Rehabilitation Team & its members, their role.
8. Community & Rehabilitation including C.B.R. Advantages of C.B.R. over I.B.R.
9. Contribution of Social Worker towards rehabilitation
10. Vocational evaluation & Goals for disabled, role of Vocational Counselor.
11. Rural rehabilitation incorporated with Primary Health...
12. Principles of communication & its problems and management.
13. Behavioral problems in the disabled its principles of management
14. Architectural barriers possible modification in relation to different disabled conditions
15. Achieving functional independence
16. Concepts in cardiac rehabilitation
17. Concepts in pulmonary rehabilitation
18. Deconditioning, conditioning & benefits of exercise
19. Spinal cord injury rehabilitation
20. Occupational rehabilitation
21. Concepts in geriatric rehabilitation
22. Introduction to sport medicine, concepts of team, approach to sports physiotherapy
23. Disability evaluation
24. Visual disability; definition and classification, mobility techniques, communication skills, prevention of blindness.
25. Socio-economic rehabilitation :
 - Outline of social and vocational counseling
 - Outline the social implications of disability for the individual for the community
 - Pre – vocational evaluation & role of V.C., Gout & NGO
 - Discuss method and team involvement in pre- vocational evaluation and training.



P.T. IN ORTHOPAEDIC CONDITIONS

1. Introduction: Brief review of the orthopedic conditions and various physiotherapeutic Modalities, aim, Means and techniques of physiotherapy should be taught.
2. Dislocations: Classification- types of displacements methods of immobilization. Healing of Fractures and factor influencing union, non-union, delayed union etc.
3. Specific fracture and their complete physiotherapeutic management.
4. Physiotherapeutic management of fracture of spine with paraplegia and without neurodeficit
2. Physiotherapy in relation to soft tissue injuries
3. Physiotherapy in relation to amputation
4. Physiotherapy in relation to various deformities eg. CTEV, Pes planes, Pes caves etc.
5. Physiotherapy in various acquired & congenital spinal
6. Physiotherapy in relation to arthritis
7. Fracture cast bracing and mobilization
8. Step program & its importance in orthopedic rehabilitation.

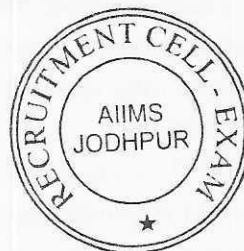
PT. IN SURGICAL CONDITIONS INCLUDING OBS & GYANEC

1. Brief review of the following surgical conditions and various physiotherapeutic modalities, aims, means and techniques of physiotherapy should be taught.
2. Pre and Post Operative Physiotherapy management of following abdominal surgical conditions including incisions. Pre and postoperative complications.
3. Herniorraphy
4. Nephrectomy
5. Radical Mastectomy etc.
6. Postural drainage & respiratory physiotherapy in CTVS
7. Physiotherapy in patients on ventilators
8. Pre and Post Operative physiotherapy management of following conditions.
9. Thorectomy
10. Lobectomy
11. Thoraco Plasty
12. Pneumonectomy
13. Orientation about atelectasis, pneumothorax, pre and post operative physiotherapy management of cardiac surgery, open ;heart surgery.
14. Burn & its classification physiotherapy management.
15. Pre and post operative physiotherapy of skin grafting
16. Physiotherapy of cases after reconstructive surgery of hand
17. Physiotherapy in obstrectics
18. Physiotherapy in PIVD, stress incontinence , Prolapsed uterus etc.
19. 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. Physiotherapy in head injury.



P.T. IN MEDICAL CONDITIONS INCLUDING PEDIATRICS

1. Introduction: Brief review of the following medical condition and various modalities or Physiotherapy, aims, means and techniques of physiotherapy should be taught.
2. Physiotherapy in diseases of respiratory system prior to beginning with various conditions brief introduction of breathing exercises and postural drainage in detail to be taught
3. Physiotherapy in relation to; Edema , Non Articular Rheumatism Rickets Vitamin Deficiency Syndrome, Myopathy and Various types of muscular dystrophy, Diabetic Neuropathy, Rheumatoid Arthritis and General Debility.
4. Physiotherapy in relation to:
Congestive Heart Failure, Myocardial Infarction & Peripheral vascular diseases
5. Physiotherapy in relation to
 - 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 Psycatric Patients



P.T. IN NEUROLOGICAL AND NEUROSURGICAL CONDITIONS

DESCRIPTION

Following the basic science and clinical science, this course introduces the student to the Neurological conditions which commonly cause disability.

Objectives

The objectives of this course is that after 300 hours of lectures & demonstrations, in addition To clinics, the student will be above to demonstrate and understanding of neurological

Conditions causing disability and their management,

In addition the student will be above to fulfill with 75% accuracy (as measured by written, Oral & practical internal evaluation the following objectives of the course.

OUTLINE

A. Neuroanatomy

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathways, connections of the cerebellum and extra-pyramidal system, relationship of the spinal cord , long tracts of the spinal cord, the brachial and lumber plexus and cranial nerves.

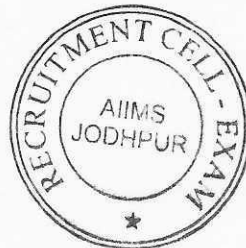
B. NEUROPHYSIOLOGY

Review in brief the neurophysiologic basis of: tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain.

C. Clinical features and management.

Briefly outline the clinical features and management of the following neurological disorders:

1. Congenital and childhood disorders
 - a. Congenital and childhood disorders
 - b. Hydrocephalus
 - c. Spina bifida
 - d. Arnold chiari malformation, dandy
2. Cerebrovascular accidents
 - a. General classification, thrombotic, embolic, hemorrhagic and inflammatory strokes.
 - b. Gross localization and sequelae.
 - c. Detailed rehabilitative programme.
3. Trauma – broad localization, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord
 - a. Cranio-vertebral junction anomalies.
 - b. Syringomyelia
 - c. Cervical and lumber
 - d. Tumors
 - e. Spinal arachnoidities
 - f. T.B spine
5. Demyelinating diseases (central and peripheral)



- a. Gullian –barre syndrome
 - b. Acute disseminated encephalomyelitis
 - c. Transverse myelitis
 - d. Multiple sclerosis
6. Degenerative disorders
- a. Parkinson’s disease
 - b. Dementia
7. Infections
- a. Pyogenic Meningitis sequelae
 - b. Tuberculosis infection of central nervous system.
 - c. Poliomyelitis
 - d. Brain abscess
8. Diseases of the muscle including myopathies: Classification, signs, symptoms, progression and management.
9. Peripheral nerve disorders
- a. Epilepsy; Definition, classification and management.
 - b. Myasthenia Gravis; Definition, course and management
 - c. Intracranial tumors; Broad classification, signs and symptoms.
 - d. Motor neuron diseases
 - e. Herniation of Brain
- D. Clinical assessment of neurological function to be taught through bedside or demonstration clinics spread out over at least 5 sessions**
- 1. . Basic history to determine whether the brain, spinal cord or peripheral nerve is involved
 - 2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
 - 3. Assessment of cranial nerves
 - 4. Assessment of Motor power.
 - 5. Assessment of Sensory functions touch, pain and positions.
 - 6. Assessment of Tone –spasticity, rigidity and hypotonia.
 - 7. Assessment of Cerebellar functions
 - 8. Assessment of Higher cortical functions –apraxia etc.
 - 9. Assessment of Gait abnormalities
-



CLINICAL REHABILITATION-II

A. PROSTHESIS AND ORTHOSIS

1. Definition and Basic Principles
2. Designing and Construction of Upper & Lower extremity Orthosis & Spinal Orthosis.
3. Prescription and design of footwear- & its modification.
4. Wheel Chairs.
5. Ambulatory Aids & Assistive Devices
6. Measurement and P.O.P. cast techniques.
7. Low cost thermo-labile material for construction of Orthosis.AB.

B. MANAGEMENT STUDIES

1. Definition-Branches of management-Principles of health sector management.
2. General principles of management-Theories of management.
3. Personnel management - Policies and procedures, Basic concepts and theories.
4. Financial issues including budget and income generation.
5. Principles of an organizational chart.
6. Organization of a department planning, space, manpower, materials, basic requirements
7. Resources and quality management –planning with change and coping with change
8. Self –management
 1. Preparing for 1st job
 2. Time management
 3. Career development

C. PROFESSIONAL MANAGEMENT AND ETHICS:

1. The implication of and confirmation to the rules of professional conduct.
2. Legal responsibility for their actions in the professional context and understanding liability and obligations in case of medico-legal actions.
3. A wider knowledge of ethics relating of current social and medical policy in the provision of health care.
4. National and international professional bodies :as a professional association, and education body-difference between scientific association (professional body) and statutory body.
5. The role of international health agencies such as WHO.

D. PROSTHESIS AND ORTHOSIS :

1. Upper limb amputee rehabilitation and prosthetic training
2. Lower limb amputee rehabilitation and prosthetic training.
3. Foot wear modification in various conditions
4. Wheel chairs and seating system.
5. Design and construction of adoptive devices.
6. Classification of AIDS & Assistive devices
7. Ambulatory AIDS & assistive devices



8. Simple splint techniques
9. Thermoplastic materials
10. Computer assistive devices & environmental control
11. Musculoskeletal problems of the upper limb.
12. Musculoskeletal problems of the lower limb.
13. Sports physiology, Physiotherapy in sports and sports injuries.
14. Rehabilitation concerns in rehabilitation.
15. Neurorehabilitation.
16. Surgical rehabilitation.
17. Rheumatology & Rehabilitation.

