

अध्याय - 04

पाठ्यक्रम

(परीक्षा में केवल एक प्रश्न पत्र रहेगा)

सामान्य प्रशासन विभाग, भोपाल मंत्रालय वल्लभ भवन, भोपाल के संशोधित
परिपत्र क्रमांक 74 दिनांक 16 फरवरी 2015 के अनुसार

प्रश्न पत्र का विवरण :

100 अंक

सं. क्र.	विषय	अंक
1	सामान्य ज्ञान	25
2	सामान्य हिन्दी	
3	सामान्य अंग्रेजी	
4	सामान्य गणित	
5	सामान्य विज्ञान	
6	सामान्य अभिरूचि	
7	तकनीकी ट्रेड पर आधारित प्रश्न	75

तकनीकी ट्रेड पर आधारित पाठ्यक्रम (SYLLABUS)

(A) नर्सिंग ऑफिसर/स्टाफ नर्स हेतु पाठ्यक्रम

1. ANATOMY AND PHYSIOLOGY

1. Structure and function of cell, tissue, Skeletal System, joints and muscles of body
2. Structure and function of various system of human body for exc. Nervous System Circulatory, Respirator System, Excretory system, Reproductive system, Endocrine system. And Digestive system of human body.
3. Sensory organs.

2. NUTRITION ANDBIOCHEMISTRY

Macro nutrient and Micro nutrient. Cookery rules and Preservation of nutrients. Role of nurse in nutrition programme

3. MICROBIOLOGY

Types of immunity, Immunization, Hyper sensitivity and auto Immunity, Control and Destruction of Microbes:- Sterilization, Disinfection, Chemotherapy and Antibiotics, Pasteurization, Medical and Surgical Asepsis, Bio safety and Waste management

4. NURSING FOUNDATION

1. concept of health, nursing profession, hospital policy, nursing process, documentation, Recording, reporting health assessment, and meeting general and special need of patients care of terminally ill patients.

5. PSYCHOLOGY

1. Personality development. Motivation and emotional process.
2. psychological assessment and mental health and hygiene.

6. COMMUNITY HEALTH NURSING

1. Health determinants, Epidemiology and nursing management of common communicable diseases and non-communicable diseases, population explosion and its control.
2. Health policy and planning, national health and family welfare programme, health agencies, role and responsibility of community health nurse

7. MEDICAL SURGICAL NURSING

1. Common signs, symptoms, and nursing management of medical and surgical systemic disorders of human body.
2. nursing management of pre and post-operative patients.
3. nursing management of communicable and non-communicable diseases
4. nursing management of patients in emergency and disaster situation.
5. nursing management of geriatric client
6. General clinical investigation
7. Oncology Nursing
8. Fluid and electrolytes balance and Imbalanced

8. CHILD HEALTH NURSING

1. modern concept of child health nursing, IMNCI, management of behavioral and social problem of children, care of new born and new born resuscitation, KMC

9. MIDWIFERY AND OBSTETRICAL NURSING

1. concept of midwifery and obstetrical nursing.
2. assessment and management of antenatal, intra-natal, and postnatal period.
3. assessment and management of normal neonates' high-risk pregnancy, abnormal Labour.
4. Drugs used in obstetric nursing, Family welfare programme.

10. MENTAL HEALTH NURSING

1. Principals and concept of mental health nursing, Assessment of mental health nursing,
2. nursing management of client with psychotic and neurotic disorder, legal issue in mental health nursing.

11. NURSING RESEARCH AND STATISTICS

1. Research approach, design, sampling review of literature, and statistical analysis

12. MANAGEMENT OF NURSING SERVICES AND EDUCATION

1. skill of communication, inter personal relationship and human relation
2. Guidance and counselling, use of A V Aids, various method of class room and clinical teaching, use of IEC material
3. Assessment of knowledge skill and attitude and OSCE
4. Management of nursing services in the hospital and community, in service education,
5. management of nursing institution and professional advancement, budget planning .

13. SOCIOLOGY

- a- Relationship between individual and society
- b- Social group, social changes, social control problems and different culture.

c- Population, family and marriage and types of community in India.

14. NURSING ADMINISTRATION AND WARD MANAGEMENT

1. Administration and management process
2. Administration of Hospital department, Units, Wards
3. Management of equipment supply
4. Cost and financing of Health care
5. Vital statistics

(B) पाठ्यक्रम - फार्मासिस्ट ग्रेड-2

PHARMACEUTICS

Introduction to different dosage forms, their classification with examples—their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia. Size reduction, Size separation, Metrology—system of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products. Use of alligation method in calculations. Isotonic solutions. Mixing and homogenization. Packaging of pharmaceuticals Extraction and galenicals, Clarification and filtration, Heat processes, Introduction to drying processes, Distillation, Sterilization—concept of sterilization and its differences from disinfection—thermal resistance of microorganisms. Detailed study different sterilization processes. Study of immunological products like sera, vaccines, toxoids and their preparations., Processing of tablets, Processing of capsules

PHARMACEUTICAL CHEMISTRY

Acids, bases and buffers, Gastrointestinal agents, Acidifying agents, Antacids, Protectives and adsorbents, Saline cathartics. Antioxidants, Topical agents — (i) Protectives (ii) Antimicrobials and astringents (iii) Sulphur and its compounds (iv) Astringents—alum and zinc sulphate. Dental product, Inhalants, Respiratory stimulants, Expectorants and emetics, Antidotes. Major intra and extracellular electrolytes, Inorganic official compounds of iron, iodine and calcium; ferrous sulfate and calcium gluconate. Radio pharmaceuticals and contrast media radioactivity, Identification tests for cations and anions as per Indian Pharmacopoeia. Quality control of drugs and pharmaceuticals

PHARMACOGNOSY

Definition, history and scope of pharmacognosy including indigenous system of medicine. Various systems of classification of drugs of natural origin. Adulteration and drug evaluation; significance of pharmacopoeial standards. therapeutic effects and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of (a) Laxatives (b) Cardiotonics (c) Carminatives & G.I. regulators catechu. hyoscyamus, belladonna, aconite, ashwagandha, ephedra, opium, cannabis, nux vomica. rauwolfia. vasaka, tolu balsam, tuls. guggal, colchicum, vinca. chaulmoogra oil. pterocarpus, gymnema sylvestro. gokhru, punarnava. ipecacuanha. benzoin, myrrh, neem, curcuma. cinchona. ergot. shark liver oil and amla. papaya, diastase, yeast. Collection and preparation of crude drugs from the market as exemplified by ergot, opium, rauwolfia, digitalis, senna. Study of source, preparation and identification of fibres used in sutures and surgical dressings—cotton, silk, wool and regenerated fibres.

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Introduction to biochemistry. Brief chemistry and role of carbohydrates, proteins, lipids, their classification and related diseases. Role of minerals and water in life processes. Brief chemistry and role of vitamins and coenzymes. brief concept of enzymatic, Introduction to pathology of blood and urine.

HUMAN ANATOMY AND PHYSIOLOGY

Definition of various terms used in anatomy, physiology, Structure of cell, unction of its components with special reference to mitochondria and microsomes. Elementary tissues of the body, Composition of blood, blood group and coagulation of blood, Name and functions of lymph glands. Anatomy and physiology of different body systems in Brief.

HEALTH EDUCATION & COMMUNITY PHARMACY

Concept of health—definition, indicators of health, concept of disease, prevention of diseases. Environment and health. First aid—emergency treatment in shock, snake bite, burns, poisoning, heart disease, fractures and resuscitation methods. Elements of minor surgery and dressings. Fundamental principles of microbiology, organisms of common diseases. Non-communicable diseases—causative agents, prevention, care and control. Cancer, diabetes, blindness, cardiovascular diseases. Communicable disease—causative agents, modes of transmission and prevention. (a) Respiratory infections—chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis. (b) Intestinal infections—poliomyelitis, hepatitis, cholera, typhoid, food poisoning, hookworm infection. (c) Arthropod borne infections—plague, malaria, filariasis. (d) Surface infections—rabies, trachoma, tetanus, leprosy. (e) Sexually transmitted diseases—syphilis, gonorrhoea, AIDS. Nutrition and health, vitamins and minerals. Demography and family planning, natural family planning methods, chemical methods, mechanical methods, hormonal, contraceptives, population problem of India. Epidemiology —I mmunity and immunisation, immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control.

DISPENSING PHARMACY

Prescriptions : Reading and understanding of prescription; Incompatibilities in prescriptions, Posology: Dose and dosage of drugs, Dispensed Medications: (i) Powders (ii) Liquid oral dosage (b) Biphasic liquid dosage forms: • Suspensions • Emulsions (iii) Dental and cosmetic preparations:

(iv) Semi-solid dosage forms: (a) Ointments (iv) emulsification. (v) Sterile dosage forms: (a) Parenteral dosage forms (b) Sterility testing, (c) Ophthalmic products— study of essential characteristics of different ophthalmic preparations.

PHARMACEUTICAL CHEMISTRY II

chemistry of pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties. The stability and storage conditions and the different types of pharmaceutical formulations of the drugs.

Pharmacology and Toxicology

Introduction to pharmacology, scope of pharmacology. Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs. General mechanism of drugs action and the factors which modify drugs action. Pharmacological classification of drugs. (i) Drugs acting on the central nervous system: (a) General anaesthetics, intravenous anaesthetics. (b) Analgesic, antipyretic, sedatives and hypnotics, anti-convulsants, (ii) Local anaesthetics. (iii) Drugs acting on autonomic nervous system. (iv) Drugs acting on eye, (v) Drugs acting on respiratory system (vi) Antacids, (vii) Cardiovascular drugs, (viii) Drugs acting on the blood and blood forming organs. (ix) Drugs affecting renal function (x) Hormones and hormone antagonists (xi) Drugs acting on digestive system

Pharmaceutical Jurisprudence

(C) पाठ्यक्रम - लेबोरेट्री टेक्नीशियन, टेक्नीशियन, टेक्नीशियन असिस्टेंट, सी.एस.एस.डी. टेक्नीशियन, लैब टेक्नीशियन, लैब असिस्टेंट

APPLIED ANATOMY & PHYSIOLOGY - Study of the structure of a cell. - Normal anatomical Structure, Histology and Functions, (Physiology) of the all Human Body Systems,

BIOCHEMISTRY - Biochemical structure of the Carbohydrates Proteins, Lipids Enzymes, Clinical Biochemistry - Kidney function tests, Liver function Test, Cardiac Profile, Lipid Profile

HEMATOLOGY - Composition of blood, collection of blood and anticoagulants, Hb estimation, TRBC count - ANAEMIAS, Preparation & staining of blood films, Leukopoiesis), TWBC & DWBC Count, Absolute values, ESR, PCV, Reticulocyte count, Platelet count, BT & CT LE cell preparation, Sickling test, Osmotic fragility Bone Marrow Examination.

BLOOD BANKING - Blood Groups, Cross Matching, Coomb's test, Donor Screening, Blood Transfusion, & transfusion reactions, Blood Components

CLINICAL PATHOLOGY - Physical chemical & microscopic examination of urine, stool examination, Semen examination, CSF exam.

PARASITOLOGY - Parasites in Blood, stool & urine

MICROBIOLOGY - Morphology of Bacteria, Culture and isolation of bacteria, Gram positive and gram negative cocci and bacilli, Anaerobic spore bearing bacilli.

SEROLOGY - Antigen & Antibodies, Diagnosis of syphilis - VDRL & RA test., Widal test, ELISA test.

HISTOLOGY - Fixatives, Tissue processing, impregnation, Block making, Section Cutting, Basic staining of sections, Collection of tissues for histology, Method of Decalcification.

CYTOLOGY - Techniques & equipments required, Fixatives and staining procedure

(D) रेडियोग्राफर, डार्क रूम असिस्टेंट, रेडियोग्राफर/रेडियोग्राफिक टेक्नीशियन

Anatomy and Physiology of Human Body

Introduction to the body as a whole. The cells, Tissues, Epithelium: Simple: Compound, Connective Tissues, Muscles, Cell regeneration, Membranes: mucous, serous, synovial Osteology (including whole skeleton, bones and joints) Development of bone (osteogenesis): cells involved Types and function of bone, Types of joints and various movement. **Axial Skeleton: Skull, Vertebral Column, Appendicular skeleton, Healing of bones.** **The respiratory system: Organs, Functions, Pharynx Larynx – Functions, lungs:** lobes, lobules, pleura.

Radiographic, Photography

Photographic process, Photographic emulsions, Film materials in x-ray department. History, structure of an x-ray film, single sided films, types of films, Spectral sensitivity of film material, graininess of film material, speed and contrast of photographic material, **Sensitometry:** photographic density, characteristic curve features of the characteristic curve, **The storage of film materials and radiograph:** Storage of unprocessed films, storing of radiographs, **Intensifying screens and cassettes. Luminescence:** fluorescence and phosphorescence. Construction of an intensifying screen, The fluorescent materials. Types of intensifying screens. Intensification factor. The influence of KV, scattered radiation. Detail, sharpness and speed, size of the crystals, reciprocity failure, Cassette design, care of cassettes, mounting of intensifying screens, Care of intensifying screens, tests to check screen film contact and light leakage, **Film processing:** Development: The nature of development, manual, automatic. The PH scale, The constitution of developing solutions and properties of development chemicals, The development time, factors in the use of a developer. Developers in processing systems, **Film processing:** fixing and role of a fixing solution. Constitution of the fixing solutions and properties of the Constituents, Fixers used in automatic processors. Factors affecting the use of the fixer, Regeneration of fixing solution. Silver recovery and its various methods, Rinsing, washing and drying. Objects of rinsing and washing, methods employed. Methods of drying films, Preparation of solutions and making stock solution, **Processing equipment: , Dark room: , Systems for daylight film handling , The radiographic image ,**

Unsharpness in the radiographic image. Various factors contributing towards unsharpness, The presentation of the Radiograph. Identification markers and orientation. Documentary preparation, **Viewing accessories**, Light images and their recording, **Fluorography**, **Subtraction**, Common film faults due to manufacturing as well as due to chemical processing, Management of the quality of the Radiographic image.

ELEMENTARY RADIATION PHYSICS

Structure of matter and principles of machines, electricity and electromagnetism applied in radiological instruments. Physics principles in design and working of x-ray tube technology. Construction and working principles of transformers and autotransformers used in x-ray circuits. Measurement of voltage special KV meters. Measurement of tube current in milli and microamperes. Principles of thermionic emission and rectification in x-ray technology. High voltage D.C. circuits in imaging and therapy tube circuits. Electrical hazards and safety x-ray tube rating in imaging and therapy x-ray tubes and thermal safety. Introduction to intensity of radiation in general and its variation by distance. Introduction to eletroma-genetic spectrum, definition of wavelength and its quantum relationship with peak kilovoltage. Physical principles of radiation and optical field coverage and the factor affecting the field projected on patient during x-ray imaging and radiotherapy exponential and trigonometric functions used in radiological calculations.

Radiography Techniques

Skeletal system: Radiography techniques for x-ray of: (a) Upper limb with special reference to joint. (b) Lower limb which includes all the bones with special reference to joint. femur and metatarsals, etc. (c) Shoulder girdle and thorax. (d) Vertebral column with special techniques for cervical spine, intervertebral joints and foramina. Limbo-sacral joint. (e) Pelvic girdle and hip region. (f) Respiratory system chest radiography for both the lungs, apical, lordotic and oblique views, techniques to decubitus AP and lateral views.

Anatomy and Physiology of Human Body :

Types of cells, tissues, bones and joints. Introduction to system and cavities of the body. Heart and Blood vessels, The Lymphatic System: The Digestive System:, The Urinary System:, The Reproductive System: Male & Female Reproductive system:, The Endocrine System:, The Organs of Sense:

RADIATION PHYSICS INCLUDING RADIATION PROTECTION

Atomic structure as applied to generation of x-rays and radioactivity spectrum of diagnostic imaging and therapy x-rays. Effects of variation of tube voltage, current, filtration, HT waveform and target material on x-ray production. Laws of radioactivity and decay schemes of different alpha, beta, gamma ray, negatron and positron emitters as used in medicine especially in radiotherapy. Artificial radionuclide generators employed in medicine in general and radiotherapy sources in particular. Interaction of radiation with matter attenuation absorption and scattering phenomena. Photoelectric absorption, Compton scattering, pair production and annihilation process, ionisation, effects of geometry of thickness of the absorber. Dependence on the nature and atomic number of the absorber and on radiation quality. Transmission of x-ray through body tissues. Linear energy transfer. Range of secondary electrons and electron build up. Relative amounts of scatter from homogeneous and heterogeneous beam during the passage through a patient. Physical requirements of beam defining devices e.g. cones, diaphragm, collimators etc. Units of radiation measurement specification of quality and half-value thickness (HVT) and its measurements, filters and filtration. Measurements of radiation and dosimetric procedures. Radiation detectors and their principles of working. Definitions of Bragg-peak, percentage depth dose, and peak scatter factor, tissue air-ratio, tissue maximum ratios scatter air ratio, isodose curves and radiation penumbra of different beams. Wedge filters, scattering foils. Physics properties of phantoms, phantom materials, bonus and bolus substitutes. Factors used for treatment dose calculation method. Physical aspects of electron and neutron beam therapy.

Radiation Protection:

Definition of radiation hazards maximum permissible dose and annual limit of intake (ALI), permissible dose levels on and around sealed source housing and installation principles of radiation protection and MPD's of different ICRP rules, stochastic and non-stochastic effects. Importance of 'ALARA' physical principles of design and planning of radiation installation. Safe work practice in tele therapy and Brach therapy. Shielding materials, radiation surveys and personnel monitoring devices film badges. TLD badges, pocket dosimeters.

BASIC RADIOGRAPHIC TECHNIQUES

Skull: Radiography of cranial bones, cranium, sella turcica, orbit, optic foramina, superior orbital fissure and inferior orbital fissure. **Facial Bones:**

Dental Radiography:. **Abdomen:**, **Macro radiography:**, **Stereography:**, **Soft tissue techniques:** , **Operation theatre techniques:**

Radiography:- techniques including special procedures.

Ventriculography and encephalography, Myelography, Angiography

(E) **O.T. TECHNICIAN**

1. Introduction to surgery and basic surgical procedures
2. Sterilization of equipment and O.T. (Aphasia, Antisepsis & Fumigation.) & O.T. hygiene.
3. Surgical infection in O.T. & prevention anti Microbial therapy.
4. Fluids & electrolytes & intra venous fluids & setting up of IV line & Eletransfuisa.
5. Shifting of O.T. patients (Pre & Post op.) Sp. trauma patients.
6. Various surgical instrument.
7. Maintenance & care of general & special surgical instruments & equipments.
8. Pre-Op requirements (case papers, Pt. identification, consent, pre-op instruments).
9. Positioning of patient for special surgical procedures.
10. Control of Hemorrhage & resusaration.
11. O.T. illumination.
12. Preparation of surgical field.
13. Assisting at operation & setting up of instrument trolley
 - (a) Gen. surgery. (b) Uri. Surgery. (c) Gastrointestinal surgery. (d) Neurosurgery. (e) Cardiovascular surgery. (f) Orthopedic surgery. (g) E.N.T surgery. (h) Gynaological & Obstetric surgery.
14. Surgical sutures.
15. Collection of specimens
16. Dressing material & their application.
17. Waste disposal.

(F) **OCCUPATIONAL THERAPIST**

Thorax :

Ribs, Vertebrae, Intercostals space, intercostals nerve, pleural, reflection, outline of respiratory system as a whole. Medicastral surface of lungs, Broncho-pulmonary segments, Mediastinum, Heart & Coronary vessels, Jonits of Thorax, Vertebral column & its applied anatomy.

Abdomen & Pelvis :

Lumbar vertebral, Sacrum, Bony Pelvis, Ant Abdominal wall, Inguinal canal & hernia, Testes, Scrotum, General outline of digestive system. Liver, gall bladder, kidney, uretger, Suprarenal glad, urinary bladder, prostate, urethra, male and female reproductive organs, joints and pelvis.

Superior Extremity :

Bones in detail Branchial Plexus including applied anatomy, Main muscle groupos and their actions, joints and their applied anatomy, Axillary lymphatic drainage of mammary gland venous drainage of upper limb.

Interior Extremity :

Bone in detail, lumber and sacral plexus, main nervesd and muscles. Arches of foot and its applied anatomy, Arterial anastomosis around knee joint venos drainage, Ingunal lymphodes joints & their applied anatomy.

Brain & Spinal Cord :

Connection & main functions of each part, internal capsule, and blood supply.

Surface Anatomy :

Bony landmarks and surface anatomy of important structures.

Human Physiology : 1. Introduction 2. Tissues. 3. Cardio Vascular Systam 4. Respiratory system 5. Neuromuscular system 6. Digestive System 7. Genito Urinary Systam 8. Endocrine System 9.

Temperature Biochemistry mm 35 : 1. Biophysics 2. Cell 3. Carbohydrates 4. Lipids 5. Proteins 6. Nucleic Acids 7. Enzymes 8. Vitamins 9. Bio-Energetics 10. Carbohydrate Metabolism 11. Lipid Metabolism 12. Protein Metabolism 13. Water and Electrolytes 14. Mineral Metabolism 15. Nutrition 16. Connective Tissue 17. Nerve Tissue 18. Muscle Tissue 19. Hormones 20. Isotopes

Pathology & Bacteriology : Pharmacology Section (B) 35• General Psychology• Principles of Occupational Therapy Theory•

(G) **Optometrist / आप्थेल्मिक असिस्टेंट**

Anatomy of eye, Physiology of eye - General consideration of different terms used in ophthalmology. Common diseases of eyelids. Common diseases of conjunctiva. Common diseases of sclera Common diseases of iris & ciliary body. Glaucoma Cataract. Orbit. Examination of eye. Special investigation of eye. Demonstrations – on above subjects. Visualaquity. amplitude of accommodation. Colour vision. Principle of Radioscopy. Static refraction. Errors of refraction. Myopia. Hypermetropia. Astigmatism. Apahna. Presbyopia. Anisometropia. Anisokomia. Physical optic. Properties of light. Principal of reflection. Principal of refractions. Lenses and their combinations. Len some try. Keratometry. Contact lenses. Indications. Types. Uses. Practice – Low vision aids.

(H) Dental Technician/Dental Mechanic/डेंटल हाईजिनिस्ट

1. Dental Anatomy and terminology
 - A study of anatomy and terminology related to construction of dental applications.
2. Complete Dentures
 - Overview of complete denture construction.
 - Anatomy and physiology of the mouth and associated structures.
 - Artificial teeth for complete dentures.
3. Partial Dentures
 - Principles and major component parts for removable partial dentures .
 - Partially edentulous classification, principles of survey and design, cast design, contour soldering, tooth arrangement and wax-up, process and finishing.
4. Tooth Morphology
 - An introduction to tooth morphology and element of occlusion.
5. Dental Material
 - Physical and chemical properties of materials used in dental appliance construction.
 - Testing and comparisons of dental materials.
6. Fixed Prosthodontics
 - The lost wax method of constructing fixed dental restorations.
 - Occluding metal crowns will be constructed on models of articulated posterior dentitions.
 - Metal crowns, pontics.
7. Complete Dentures Construction
 - Complete dentures and post-processing occlusal refinement.
8. Partial Denture Construction
 - The study and construction of removable orthodontics.
 - Contouring of wires to complete various techniques in anchorage, retention and tooth movement.
 - Removable cast partial frameworks.
 - Prescriptions, principles of design, spruing techniques.
 - Processing in cold cure, pour and heat cure techniques.
9. Fixed Prosthodontics
 - Stress directing attachments in fixed partial dentures.
 - Designing metal structures for ceramometal restorations.
 - Dental porcelains and aesthetic restorations.
 - Dental porcelains and ceramometal techniques, maxillofacial appliances.

(I) PROSTHETIC AND ORTHOTIC TECHNICIAN / प्रोस्थो टेक्नीशियन

Prosthetics (Upper Extremity)

- (i) Classification by level of amputation. (ii) Medical consideration applied anatomy and pathological consideration
(iii) Classification of congenital skeletal limb deficiencies (iv) Prosthetic prescription (v) Amputee trainee (i) Components of upper extremity prostheses, control & harness systems. (ii) Fabrication principle & procedures for upper extremity prostheses (iii) Measurement fitting & alignment
(iv) Check-out & care of B.E. prostheses.
(v) Bio-mechanics of U.E. prostheses. (vi) Harness & control systems Below Elbow harnessing & this causes, shoulder amputee harnessing (vii) Clinical aspects of U.E. prosthesis (viii) Training in the use of U.E. prosthesis (ix) Electro-mechanical myoelectric and other externally powered prostheses (x) Study of publication sources for updating information on upper limb prostheses

Prosthetics (Lower Extremity)

Medical Subjects (i) Levels of amputation & limiting factor (lower extremity)

(ii) Psychological aspects of amputation (iii) Classification of congenital skeletal limb deficiencies.

(iv) Prosthetic / Orthotic assessment and evaluation techniques (v) Prosthetic prescription (vi) Immediate & early Prosthetic management

Technical (i) Prosthetic components below knee & above knee (ii) Examination of stump, measurement, cast taking POP modification, fabrication, alignment & fitting procedures for below knee & above knee amputations (this include prosthesis for partial foot, choparts, syme's below knee, through knee above knee amputations

(iii) Gait analysis of BK/ AK amputees fitted with prostheses. (iv) Check out of below knee & above knee prosthesis (v) Maintenance & care of prosthesis (vi) Hip disarticulation & Hemipelvectomy prosthesis (vii) Bio-mechanics of below knee, above knee & hip disarticulation prosthesis (viii) Fluid controlled prosthesis (ix) Modular & other modern types of prosthesis

Orthotic (Upper Extremity)

Functional anatomy of the hand

How to train the patients to use functional splint & arms braces.

Measurement, selection of materials & components, fabrication & fitting of the following:

- (i) Static fingers hand splints. (ii) Functional hand splints (iii) Functional arm braces (iv) Feeders (v) Special assistive devices (vi) Myoelectric & other externally powered upper extremity orthoses

Biomechanics of functional hand splints and arm Orthosis Orthotic (Lower Extremity)

Foot Orthoses

Medical - (i) Anatomy of Foot (ii) Orthotic - Prescription for different pathological condition, pathomechanics of foot & ankles.

Technical- (i) Shoes, boots & their components (ii) Shoe modifications, principles & procedures in clinical application (iii) Biomechanics of the foot

Ankle Foot Orthoses, K.O. KAFO, EKAFO, GIL, HKAFO-

Medical - (i) Pathomechanics Lower extremity (including foot, ankle, knee and hip.) (ii) Introduction to Orthotic management (iii) Orthotic prescription (iv) The influence of error in bracing upon deformity of lower extremity (v) Gait training

Technical- (i) Lower extremity orthotic components & functions. (ii) Principles of taking measurements, selection of components, fabrication, alignment fitting and check-out of orthoses. (iii) Analysis of Pathological & orthotic gait (iv) Study of publications sources for up- to-date information on lower extremity Orthoses.

(J) SpeechTherapist

Normal aspects of speech, language and communication :

1. **History and development of the profession of speech – language pathology.**
 - Major work activities of SLP.
 - Various settings of service delivery.
 - Other professions concerned with communication disorders.
2. **Human Communication**
 - Definition and components.
 - Distinctions and similarities between communication, speech and language.
 - Speech chain.
 - Functions of Communication, speech and language
 - Modes of communication.
 - Characteristics of good speech.
3. **The Physical mechanism of speech and language production.**
 - Anatomy and Physiology of respiratory system.
 - Respiration for life and speech.
 - Anatomy and physiology of laryngeal system.
 - Bases of pitch and loudness change mechanism.
 - Anatomy and physiology of articulatory system
 - Anatomy of the nervous system related to speech and language.
 - Speech as an overlaid function.
4. **Acoustic aspect of speech**
 - Source filter theory of speech production.
 - Harmonics, formants, transients and aperiodic energy.
 - Acoustic characteristics of normal voice and prosody.
5. **Interactive bases of human communication**
 - Social bases.
 - Cognitive bases.
 - Psychological bases.
6. **Normal development of communication**
 - Development of communicative intent.
 - Development of voice.
 - Development of Phonology.
 - Development of Semantics.
 - Development of Syntax.
 - Development Pragmatics.
 - Prerequisites for language and speech development.
 - Factors affecting language and speech development.
 - Theories of language acquisition – Innate Vs Acquired – a brief introduction
 - Models of speech production.
 - Stages of language and speech development.
 - Speech and language skills of infants, toddlers, pre-schoolers, school-going children and adolescents.

Speech and language disorder

1. **Definitions, cause and characteristics of :**
 - a. Developmental language disorder
 - b. Articulation disorders
 - c. Fluency disorders
 - d. Voice disorders
 - e. Cerebral palsy
 - f. Cleft lip and palate
 - g. Aphasia
 - h. Learning disability
2. **General principles of assessment and intervention**

Definitions and goals of assessment and intervention.

Basic procedures in assessment and intervention (interview, informal and formal procedures).
Report writing and counselling – an introduction.
Informal assessment of pre-requisites for language oral peripheral mechanism, child directed

(K) रेडियोथेरेपी टेक्नीशियन

Basic sciences

Applied Anatomy & Physiology of all malignant Tumors of the human body.

Oral Cavity, Pharynx, Larynx, Oesophagus, G.I. Geneto urinary system, Respiratory systems.

The pathology of the tumors.

1. Radiotherapy Machines: Superficial X-Ray therapy, orthovoltage therapy or Deep X- Ray therapy, Mega voltage therapy Van De graph Generator, Linear Accelerator, Betatron Cyclotron, Machines, using Radio nuclides, Cobalt- 60 units, Caesium- 137 Units Source Housing Beam Collimation and Penumbra.

2. Radio effects of ionizing radiation & Radiation Protection Cell and its Constituents, Effects of radiation of cells, Cell Cervical Curves somatic effects, hereditary effects of Radiation in Man. Operational Limits, Dose Limits for Radiation Workers, Dose Limits to members of Public, Personal Monitoring Film Badge, Radiation Hazard evaluation and control, Time, Distance and shielding, Planning of Teletherapy and Brach therapy Facility. Radiation Emergencies and Preparedness Radiation Safety during source transfer Units, National Regulatory Requirements for Radiotherapy equipment radiation Protection Survey.

3. Treatment Planning: Absorbed Dose, Depth Dose Distribution, Percentage Depth Dose, Initial Dos buildup, issue Air Ratio, Back Scatter factor, Scatter air ratio, Isodose, charts field size, wedge filters, Combination of Radiation fields Parallel opposed fields, Multiple fields, SSD Technique, SAD Technique wedge field Techniques, Uniform Dose Distribution, Tumour Dose, specification, Target volume, Treatment volume, Rotation Therapy, ARC therapy, Tissue compensators, design of Compensators, Compensators wedges, Patient positioning simulation Procedure, Treatment setup, Field Blocks & Field shaping as a function of Photon energy, skin sparing at oblique incidence, separation of adjacent fields, Electron Beam Therapy.

4) Nuclear medicine: Radio Nuclides in Nuclear Medicine Production of short lived radio nuclides, nuclear medicine isotopes used in viva & Vitro tests, decontamination procedures, scintillation camera, scanners and uptake studies, Program and other Gamma Camera ionizing imaging procedures, Hand & foot detectors. Flame hard and isotope waste wet & dry disposal procedures. Preparation for labeling and tragedy of isotopes in imaging.

RADIATION PHYSICS

1) Structure of matter: The Atom, the nucleus, elemental particles, Atomic Mass and energy units, extra nuclear structure, molecular structure and Bonds, Atomic Energy Levels, Nuclear Energy levels, Electro magnetic Radiation, Quantum Nature of Radiation. The Electro magnetic Spectrum, Radiation Energy, Particle Radiation.

2) The Fundamentals of Nuclear physics: Natural & Artificial Radio- Activity, Exponential Decay, and activity. The Half life and Radio Active Series, Growth of Radio Active Daughter (Equilibrium) Modes of Radioactive Decay, Alpha Decay, Beta decay, Internal conversion Isomeric Transition, Nuclear Reaction, The (Alpha, P) (Alpha, N) Reactions, Proton, Bombardment photo Disintegration, Fission, Fusion, Activation of Nuclides.

3) Production of X- Rays: The X- Ray Tube: - Anode, Cathode, Basic X- Ray, Circuit, Voltage rectification Diagnostic X- ray tube, The Ray X- ray tube physics of X- rays production, Bremsstrahlung Characteristics X-ray: Operating characteristics of X- ray tubes (ratings), KVP, MAS cooling time Modern, X-Ray tubes. Focal spot rotating Anodes, X- Ray tube housing special purpose, X- ray tubes, X- Ray timers, Calibration of timers- spinning top. Quality controls of an X- Ray installation.

4) Interaction of X- Rays & R- Ray with matter: Ionization, Beam, attenuation, Half value layer, Linear attenuation co- efficient Mass attenuation co- efficient photoelectric adsorption, Compton Absorption and coherent shattering pair production stopping power of medium penetration of charged particles through matter.

5) The Radio logic Examination: The primary Radio logic image, Radiographic, Images Radiographic and Fluorescent screens, Image Amplifying systems, Radiographic film, Grids, Factors effecting the Radio logic Image, Characteristics curve of film, Dark room film, automatic film processors.

6) Radiation Quantities and Units: anode, X- ray housing special purpose X- Ray Tubes, X- ray timers, Activity, Kerma, Exposure, Absorbed Dose, Dose equivalent dose.

7) Principles of Radiation detection and Monitoring Devices: Using a generator, elution procedure with BARC MO- TC Generator, production of TC- 99 M., Localization Mechanisms, General Methodology of preparing Radio pharmaceutical, Quality control of Radio- Pharmaceutical, TC- 99 M. leveled radio Pharmaceutical, Radio- Iodine leveled Compounds, Compounds leveled with other Radio Nuclides statistics of Radio- Isotopes counting Resolving time and loss of counts, sodium iodide, as X- ray detector, ER- Ray, spectrometer, preamplifier, Amplifier, Pulse storage Data processing and display, Thyroid uptake probe, Rectilinear scanner, Gamma Camera, Collimator performance, Collimator detector sensitivity, Collimator properties, pin hole and multi channel collimators, Gamma Camera performance tests, Hines reference, Phantom and Bar Phantoms. Dynamic perfusion Scanning procedure of thyroid Brain, lung, Bone, Kidney, Liver, Spleen, Pancreas, and Myocardial imaging Radionuclide Therapy.

(L) Anaesthesia Technician

1. Preliminary knowledge of basic principles of anaesthesia equipments. (Gas pipeline system, oxygen cylinders, anaesthesia machine, various circuits tubes, vaporizers, monitors, ventilators.)
2. Basic knowledge of drugs commonly used in anaesthesia practice (in OT, ICU), resuscitation.
3. Cleaning & sterilization of the equipments used routinely.

4. To assist the anaesthesiologist in preparing the patient for anaesthesia. And intra and post-operative care for the patient.
5. To assist the anaesthesiologist in ICU. (Care of the unconscious patient)
6. To learn and assist the anaesthesiologist during CPR.
7. Documentation of anaesthesia record.

Operation Theatre Technician Topics for Anaesthesia:

1. Introduction and types of anaesthesia.
2. General anaesthesia – anaesthetic gases and volatile anaesthesia agent.
3. Equipment for general anaesthesia – anaesthetic machine & other instrument preparation and arrangement.
4. Drugs used for pre-operative, intra operative and post-operative medication.
5. Arrangement drugs and other equipment in O.T.
6. Regional Anaesthesia – spinal, epidural, nerve & plexus blocks.
7. Preparation and arrangement for regional anaesthesia.
8. Clinical observation and identification of sign and symptoms of shock, allergic reactions respiratory distress & assistance in other emergency conditions.
9. Requirements and assistance in conduct of anaesthesia intensive therapy unit and resuscitation.
10. Intravenous infusion solutions and blood transfusion therapy.
11. Pre-operative check-up, and preparation of patient for anaesthesia.
12. Post-operative observation and care of patient.
13. Maintenance, care and sterilization of anaesthesia equipments.
14. Care, maintenance and use of monitoring equipment used in anaesthesia.
15. Record keeping and maintenance of record of drugs and patient anaesthesia record.

(M) EEG Technician

(1) Basic Human Sciences, (2) Introduction of neuroscience, (3) Electroneurodiagnostic technology, (4) EEG instrumentation, (5) Electroneurodiagnostics, (6) Neurological disorders, (7) EEG recording, (8) Electrocardiography, (9) EEG lab management, (10) Clinical correlations, (11) EEG clinical practicum.

(N) CSSD Technician

(1) Introduction to CSSD, (2) Sterilization Techniques, (3) Infection Control, (4) Medical Terminology, (5) Sterile Supply Management, (6) Sterilizer Operation and Maintenance, (7) Quality Control in CSSD, (8) Documentation in CSSD, (9) CSSD and Infection Control Coordination.

(O) लेब अटेंडेंट/ डिसेक्शन हॉल अटेंडेंट/ओ.पी.डी. अटेंडेंट/ड्रेसर ग्रेड-2

बायोलॉजी, केमिस्ट्री तथा फिसिक्स में हायर सेकेंडरी (10+2 प्रणाली) स्तर का पाठ्यक्रम
