Paramedical and Health Care (PHC)
Paper-I

Unit-1 Human Anatomy

• Introduction to Anatomy
  o Different parts of Human Body,
  o Anatomical position, Directional terms, Common anatomical places
  o Systemic and regional anatomy
• Histology
  o Typical animal cell-structure and functions
  o Tissues of the body classification and function
• Skeletal System
  o Bones of the skull, vertebral column, shoulder girdle, thoracic cage and pelvic girdle
  o Bones of the limbs
  o Joints and movements
• Muscular system
  o Types of muscles
  o Principle muscles of the body, tendons, fascias
• Nervous system
  o Central nervous system, Brain meninges, CSF, Spinal cord
  o Peripheral nervous system cranial, spinal nerves system, autonomic nervous system
  o Sympathetic and para sympathetic
• Cardiovascular system
  o Heart
  o Blood Vessels
• Lymphatic and RE system, Spleen
• Respiratory system
  o Nose, Pharynx, Larynx, Tonsils
  o Trachea, Bronchi
  o Lungs and Pleura
• Alimentary System
  o Mouth and Oesophagus,
  o Stomach,
  o Pancreas, liver and gall bladder
  o Intestines, peritoneum
• Urinary system
  o Kidneys
  o Ureter, urinary bladder and urethra
• Reproductive System
  o Male genital system
  o Female genital system and accessory organs
- Skin
- Special Senses
  - Eye and vision
  - Ears and hearing equilibrium
  - Taste, Smell, General Sensibility Viz. touch etc. surface anatomy
- Head and neck
  - Thorax(Heart and lungs) and abdomen (Stomach, Spleen liver, kidney and bladder)
  - Places and regions of abdomen and location of different organs in stomach
  - Surface marking of important blood vessels, nerves and muscles for injection

**Unit-II Human Physiology**

- Blood
  - Composition and general functions of blood
  - Description of blood cells- normal counts and functions steps of coagulation
  - Anticoagulants
  - Cerebrospinal fluid, formation, composition and function, Blood groups ABO and RH basis for classification, importance of blood groups, compositions and functions of lymph
- Respiratory System
  - Name and structures involved in respiration and their function. External and internal respiration
  - How inspiration expiration are brought about
  - Transport of $O_2$ and $CO_2$ in the blood
  - Definition of respiratory rate, Tidal volume, vital capacity
  - Hypoxia
- Excretory System
  - Functions of kidney
  - Nephron – functions of glomerulus and tubules, Composition of Urine, normal and abnormal
- Skin
  - Functions of skin
- Digestive Systems
  - Composition and functions of saliva, mastication and deglutition
  - Functions of stomach, composition of gastric juice, pancreatic juice
  - Bile and success enteritis
  - Digestion of food by different enzymes, absorption and defecation
- Endocrine – glands
  - Definition of endocrine gland, name of the endocrine glands and the hormones secreted by them
  - Major actions of each hormone
  - Reproductive system
  - Name of primary and accessory organs in male and female
  - Name of secondary sexual characters in male and female
Functions of ovary-formation of ova, actions of ovarian hormones, Menstrual cycle
Function of Testis – Spermatogenesis and actions of Testosterone, Fertilisation
Vasectomy and Tubectomy

Unit-III Laboratory Management and Ethics

- Role of laboratory in health care deliver
  - General
  - Human health and diseases
    - Types of diseases
    - Process of diagnosis
  - Laboratory at different level
  - Duties and responsibility of laboratory persons

- Laboratory services in the health delivery system
  - Laboratory service in India
  - The health administration system in India
    - At the National level
    - At the state level
    - At the district level
    - At the village level
    - Voluntary health organisations in India
    - Health programmes in India

- Laboratory Planning
  - General principles
  - Laboratory goals
  - Operational data
    - Market potential
    - Hospital/laboratory relatives
    - Competitions
    - Laboratory trends
  - Planning at different levels
  - Guiding principles for planning hospital laboratory services
    - Factors
    - Guiding principles for planning
    - Functions criteria
    - Operational demand
    - Sections of a hospital laboratory
    - Common areas
    - Design aspect
    - Space requirement
  - Planning for 3 basic health laboratory

Unit-IV

- Health and Sanitation
- Disease Prevention & Community Organisation
Practicals

- Cleansing of glasswares (Pipettes, slides, and cover slips, syringes and needles, blood cell diluting pipettes, glassware used for bacteria investigation)
- Making simple glass items in the laboratory (pasture pipette, stirring bending glass and preparing a wash bottle)
- Demonstration of use and care of instruments, cautions precautions to be taken
- Demonstration of safety measures during work in laboratory in various fields
- Demonstration of safe handling of specimens and infections agents including HBs Ag (Hepatitis) and AIDS (HIV)
  - Specimen handing collection, preservation, transportation, disposal
  - Laboratory safety and first Aid
  - Biomedical waste management
  - Computer application
Unit-I Biochemistry

- Inorganic and physical aspects of biochemistry, structure of atoms, symbol, valency and formula
  - Chemical units- Atomic weight, molecular weight, gram mole
    Equivalent weight, gram equivalent
  - Fundamental laws of Chemistry
  - Acids, bases and salts
  - Hydrogen concentration and pH Measurement – Indicators and pH meter
  - Buffers, preparation
  - Solutions – solute and solvent, saturated solutions, solubility
    Temp. effects
  - Concentrations of solutions in different ways viz molar normal percentage etc.
  - Simple qualitative analysis – captions Anions
  - Volumetric (Titrimetric) analysis
  - Primary and secondary standards
  - Acid-base titrations, permanaganometry
  - Rules in volumetric analysis
  - Isotopes definition/examples/uses
- Chemistry of Bimolecular – carbohydrates, lipids, amino-acids, proteins, nucleic acids, Vitamins
- Isotopes

Unit-II Clinical Biochemistry

- Bioenergetics – Respiratory Chain, Oxidative, Phosphorylation
- Overview of Metabolism
- Carbohydrate Metabolism
  - Glycolysis and TCA cycle
  - Blood glucose homeostasis
  - Measurement of blood glucose
  - Glycosuria, Diabetes mellitus
- Lipid Metabolism
  - Cholesterol
  - Triglycerides
  - Lipoproteins
  - Ketone bodies – formation, ketosis, ketonuria
- Amino acid & Protein metabolism
  - Urea synthesis – uremia
  - Other nonoperation nitrogenous compound like vaginate uvicacid
Biochemical reactions of amino acids: Transamination, deamination
Synthesis of physiologically important substances from amino acids
- Metabolic inter-relationships
- Principles of inborn errors of metabolism
- Water, Na+K= and Cl, Bicarbonates, Acid Base Balance, calcium and Phosphorous
- Role and iron, iodine and other Trace elements

**Unit-III General Principles of Laboratory Technology**

- Role of laboratory in health care delivery – human health and diseases
- Role of laboratory in diagnosis of disease in health delivery system
  - Duties and responsibility of laboratory personal
- Laboratory services in the health delivery system in India
- Laboratory planning
  - General principles
  - Laboratory goals
  - Operational date
  - Guiding principles for planning hospital laboratory services, particularly for basic health laboratory
- Laboratory organization
  - General principles
  - Components and functions of a laboratory
  - Staffing the laboratory
  - Job description- job specifications
  - Work schedule- personal rearrangement and work load assessment
- Care of laboratory glassware, equipments and chemicals verbal
- Principals – different types of glassware and plastic ware
  - Care and cleaning of glasswares
  - Making simple glasswares in the laboratory
  - Care of equipments and apparatus
  - Laboratory chemicals, their proper use and care, storage
  - Labeling
- Specimen handling
  - Collection techniques and containers for specimen collection
  - Types of specimen
    - Entry, handling
    - Specimen transport
    - Specimen disposal
    - Specimen preservation
- Laboratory safety
  - General principles
  - Laboratory hazards
• Safety programme
• First aid
• Safety measure – mechanical, electrical, chemical, Biological & radioactive

• Communication: Personnel Development and Relations, general principles
  o Inter/intra departmental communications request/report forms

• Basic Principles of quality control
  o General Principles
  o Non-analytical functions
  o Request specifications
  o Specimen specification
  o Distribution of tests
  o Analytical function
  o Methods, equipment, reagents and material controls, proficiency testing
  o Materials management
  o General principles

• Basic Medical Nursing

Unit. IV Clinical Pathology

• Urine analysis
  o Physical, Chemical, Microscopic
• Faucal analysis
  o Physical
  o Chemical – Occult blood exam.
  o microscopic
• Sputum analysis – physical and microscopic
• Seraianal Fluid analysis
• Examination of aspiration fluid
  o Ascetic fluid
  o Pleural fluid
  o CSF
  o others
• Pregnancy tests

Practicals

• Routine analysis of urine
• Analysis of faces including occult blood test
• Examination of sputum
• Seminal fluid analysis
• Analysis of aspiration fluid
• Pregnancy test – urine for HCG