

प्राज्ञिक सेवा, इन्टर्नल मेडिसिन समूह, **Nephrology** उपसमूह सहायक प्राध्यापक पद, नौ ख (९ ख) तहको खुला र
आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

PAPER II: TECHNICAL SUBJECT
SECTION (A) INTERNAL MEDICINE- 45 MARKS

1. Anatomy

1.1 Neuro-Anatomy

- 1.1.1 Neuron and its structure
- 1.1.2 Supportive cell type structure, cellular and myelin sheaths
- 1.1.3 Synapsis, neuro-effective junctions and receptors
- 1.1.4 Cerebrum: morphology, cerebral cortex, cortical neurons, cortical layers
- 1.1.5 Motorsystem: structure, corticospinal, rubrospinal, vestibulospinal and reticulospinal tracts
- 1.1.6 Basalganglia: structure
- 1.1.7 Cerebellum: morphology, cellular structure and organization
- 1.1.8 Brainstem: general organization
- 1.1.9 Spinal cord and ganglia: morphology, motor and sensory organization in the spinal cord

1.2 Anatomy of neuro-muscular system

- 1.2.1 LMN, structuring of voluntary muscles, motor units, types of muscle fibres
- 1.2.2 Muscle spindles and other muscles & tendon receptors
- 1.2.3 Sensory system
- 1.2.4 Reflex pathways: involving cranial nerves, and limb and trunk
- 1.2.5 Cranial nerves and special senses: pathways and structure of special sense organs
- 1.2.6 Anatomy of ventricular system and CSF production
- 1.2.7 Anatomy of meninges
- 1.2.8 Autonomic nervous system
- 1.2.9 Arterial and venous cerebral circulation
- 1.2.10 Blood brain barrier

1.3 Pulmonology

- 1.3.1 Gross anatomy of upper and lower respiratory tracts, lungs with lobes and fissures with surface marking
- 1.3.2 Concept of bronch opulmonary segments and lobule or acinus aerated by a terminal bronchiole
- 1.3.3 Histology of alveolar lining cells
- 1.3.4 Pulmonary vascular bed
- 1.3.5 Pleura and pleural space, functions and histology
- 1.3.6 Media stinum and their structures
- 1.3.7 Thoracic cage and primary and secondary muscles of respiration
- 1.3.8 Thediaphragm its attachments, nerve supply and function
- 1.3.9 Lymphatic drainage of lungs and pleura
- 1.3.10 Innervation of the lungs
- 1.3.11 Thoracic receptors

1.4 Cardiovascular system

- 1.4.1 Gross anatomy of the heart and circulatory system
- 1.4.2 Histology of the cardiac muscles
- 1.4.3 Embryology of the heart and circulation
- 1.4.4 Coronary and pulmonary circulation

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1.5 Gastrointestinal tract

- 1.5.1 Gross anatomy of the gastrointestinal tract at different levels
- 1.5.2 Gross anatomy of the hepatobiliary system and pancreas
- 1.5.3 Histological aspects of GI tract at different levels
- 1.5.4 Blood supply and development aspects of GI tract and hepatobiliary system

1.6 Kidney and urinary tract

- 1.6.1 Gross anatomy of the kidney and urinary tract
- 1.6.2 Structure of nephron and function at different level
- 1.6.3 Development of kidney and urinary tract
- 1.6.4 Renal circulation

1.7 Endocrinal organs

- 1.7.1 Gross anatomy of different endocrinal organs and their development
- 1.7.2 Histology of different endocrinal organs

2. Physiology

- 2.1 Homeostatic behaviors of different fluid compartment in the body and implications during common clinical situations of burn, blood loss, diarrhea, vomiting, etc.
- 2.2 Role of pH in normal and in abnormal conditions e.g., diarrhea, vomiting, airway obstruction, medication, etc
- 2.3 Functions of micro/macro molecular, organelles and other structures of the cell
- 2.4 Nutritional requirements of normal people (different ages, male, female) and ill patients of all categories with their modality of supplement
- 2.5 Mechanisms of metabolic response to trauma and infection
- 2.6 Function of hemopoietic /R.E.system
- 2.7 Blood groups, methods of transfusion of blood & blood products & their hazards
- 2.8 Mechanism of haemostasis, fibrinolysis & methods to control haemorrhage
- 2.9 Types of excitable tissues and methods of recording their activity e.g., EMG, EEG, ECG, etc
- 2.10 Cellular communication, chemical/neuronal/ electrical/synaptic transmission
- 2.11 Autonomic nervous system
- 2.12 Neuro transmitters, their synthesis and metabolism
- 2.13 Drugs affecting neurotransmitter activity
- 2.14 Cardiac and smooth muscles
- 2.15 Calcium metabolism
- 2.16 Pain and the mechanism of pain
- 2.17 Physiology of consciousness and sleep mechanism
- 2.18 Effect of injury to neurons
- 2.19 Different methods of monitoring of the heart functions
- 2.20 Drugs used for inotropic & chronotropic effects
- 2.21 Mechanism of blood pressure regulation
- 2.22 Physiology of circulation of different organ in the body
- 2.23 Pathophysiology of shock and principle of their management
- 2.24 Capillary exchange
- 2.25 Assess vascular functions
- 2.26 Respiration & cause of breathlessness
- 2.27 Measure blood flow
- 2.28 Measure/ assess blood gas
- 2.29 Mechanism of respiratory control

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- 2.30 Mechanism of transport
- 2.31 Use of oxygen as therapy
- 2.32 Mechanism of absorption from gut and physiology of gastrointestinal motility
- 2.33 Composition of GI and hepatobiliary secretions and methods for their assessment
- 2.34 Normal functions of the liver
- 2.35 Formation of urine
- 2.36 Mechanism of osmoregulation
- 2.37 Normal thermoregulation
- 2.38 Mechanism of hormone synthesis, secretion, metabolism

3. Pathology

- 3.1 Concept of cell injury, different types of degeneration & trauma
- 3.2 Principles of inflammation and the results of various types of inflammation
- 3.3 Acute and chronic inflammation
- 3.4 Tissue regeneration, wound healing and healing process
- 3.5 Various types of disorder of growth
- 3.6 Principles of neoplasia
- 3.7 Benign and malignant tumor
- 3.8 Mechanism of thrombosis, and embolism and their effects
- 3.9 Ischemia & infarction
- 3.10 Mechanism of blood clotting and different types of bleeding disorders
- 3.11 Principle of blood grouping system & complications of blood transfusion
- 3.12 Principle of shock
- 3.13 Principle of genetics and apply its concept in hereditary diseases
- 3.14 Principle of immune response
- 3.15 Humoral and cell mediated immunity
- 3.16 Principle of organ transplantation and causes of its rejection
- 3.17 Principle of Host Parasite relationship
- 3.18 Different types of micro-organism (Bacteria, Fungus, Parasite, and Virus)
- 3.19 Pathogenic and non-pathogenic micro-organisms
- 3.20 Principle of asepsis & antisepsis, sterilization and disinfection
- 3.21 Principle of antibiotic and chemotherapy
- 3.22 Microbes that cause wound infection
- 3.23 Principle of Hospital infection (Nosocomial infection)

4. Clinical Pharmacology

4.1 General clinical pharmacology

- 4.1.1 Pharmacokinetics, pharmacodynamics, adverse drug reactions, drug interactions, drug use in childhood, pregnancy, lactation, and old age
- 4.1.2 Clinical trials
- 4.1.3 Rational drug use

4.2 Neurosensory and musculoskeletal systems

- 4.2.1 Parasympathomimetics and parasympatholytics, adrenergic and antiadrenergic drugs, narcotic and non-narcotic analgesics, non-steroidal anti-inflammatory drugs, alcohol, sedative/hypnotics, anti-parkinsonism drugs, anesthetics (general and local), appetite suppressants
- 4.2.2 Drugs for psychiatric disorder, gout and rheumatoid arthritis, vertigo, and eye, ENT, and skin diseases

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- 4.3 **Cardiovascular system**
 - 4.3.1 Drugs for the treatment of heart failure, cardiac arrhythmias, angina pectoris, hypertension, shock, thromboembolic disorders, myocardial infarction, anemia
 - 4.3.2 Hemostatics, anti-coagulants, and lipid-lowering drugs
- 4.4 **Gastrointestinal system**
 - 4.4.1 Drugs for peptic ulcer, diarrhoea, constipation
 - 4.4.2 Antispasmodics, antiemetics
- 4.5 **Respiratory system**
 - 4.5.1 Drugs for bronchial asthma
 - 4.5.2 Antihistamines and other antiallergic agents
 - 4.5.3 Cough preparation, nasal decongestants, and respiratory stimulants
- 4.6 **Reproductive/Endocrine systems**
 - 4.6.1 Anti-diabetics, thyroid and anti-thyroid drugs, corticosteroids, sex hormones and antagonists, hypothalamic and pituitary hormones
 - 4.6.2 Drugs used in labor and puerperium
- 4.7 **Renal/Electrolyte system**
 - 4.7.1 Drugs for edema, and fluid/electrolyte and acid/base disturbances
- 4.8 **Infections**
 - 4.8.1 General principle of chemotherapy
 - 4.8.2 Antibacterial, antiprotozoal, anthelmintic, antifungal, and antiviral drugs
- 4.9 **Miscellaneous drugs**
 - 4.9.1 Drugs for malignant diseases and immunosuppression
 - 4.9.2 Vaccines
 - 4.9.3 Vitamins and minerals
 - 4.9.4 Antidotes
5. **Recent Advances in Internal Medicine and Emergencies**
 - 5.1 Recent advances in all disciplines of Internal Medicine
 - 5.2 Cardiovascular emergencies: Cardiac arrest, Acute MI, Cardiogenic shock, Cardiacarrhythmias, Pulmonary edema, Hypertensive crisis, Acute cardiac tamponade, DVT & pulmonary embolism
 - 5.3 Respiratory emergencies: Hemoptysis, Acute respiratory failure, Pneumothorax, Statusasthmaticus, ARDS
 - 5.4 Gastrointestinal emergencies: G.I. bleeding, Acute gastroenteritis and food poisoning, Acute pancreatitis, Hepatic failure, Acute abdomen
 - 5.5 Neurological emergencies: CVA including SAH, Hypertensive encephalopathy, Meningitis, Encephalitis, Unconscious patient, Status epilepticus, Myastheniagravis
 - 5.6 Endocrine and metabolic emergencies: DKA and coma, Hypoglycemia, Hyperosmolar non ketotic diabetic coma, Thyroid crisis, Myxoedema coma, Pheochromocytoma, Acuteadrenocorticalcrisis, Hypopituitarism
 - 5.7 Hematological emergencies: Aplastic anaemia, Agranulocytosis, Acutethromocythpenicpurpur, Leukemia, Hemophiliaandallieddisorders
 - 5.8 Renal emergencies: Renalcolic, Renalfailure, Hematuria
 - 5.9 Miscellaneous emergencies:
 - 5.9.1 Emergencies in fluid and electrolyte balance
 - 5.9.2 Acute emergencies in infectious and tropicaldisease
 - 5.9.3 Malaria
 - 5.9.4 Septicemia

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- 5.9.5 Tetanus
- 5.9.6 Snakebite
- 5.9.7 Dog bite & rabies
- 5.9.8 Poisonings
- 5.9.9 Drowning
- 5.9.10 Electrocution
- 5.9.11 High altitude sickness

6. Principles and Practice of Internal Medicine

6.1 Gastroenterology

- 6.1.1 Acid peptic diseases
- 6.1.2 Gastrointestinal bleeding: upper (nonvariceal/variceal) and lower
- 6.1.3 Gastroesophageal reflux disease (GERD)
- 6.1.4 Dysphagia in relation to malignancy and achalasia
- 6.1.5 Malabsorption syndrome
- 6.1.6 IBD: ulcerative colitis and Crohn's disease
- 6.1.7 Diverticular diseases
- 6.1.8 Irritable bowel syndrome
- 6.1.9 Acute abdomen
- 6.1.10 Ascites
- 6.1.11 Liver disorders
- 6.1.12 Hepatitis: acute and chronic
- 6.1.13 Cirrhosis with special reference
- 6.1.14 Hepatic cellular cancer
- 6.1.15 Jaundice: obstructive and non-obstructive
- 6.1.16 Liver failure: acute and chronic
- 6.1.17 Pancreas
- 6.1.18 Acute, recurrent & chronic pancreatitis
- 6.1.19 Pancreatic tumor (exocrine & endocrine)
- 6.1.20 Cystic fibrosis & other childhood disorder of the pancreas
- 6.1.21 Hereditary pancreatitis
- 6.1.22 Pancreatic transplantation

6.2 Respiratory Medicine

- 6.2.1 Anatomy and applied physiology of the respiratory system
- 6.2.2 Understanding of basic pathophysiology and be able to manage the disease processes mentioned below considering the relevant differential diagnosis:
 - 6.2.2.1 Pneumonias
 - 6.2.2.2 Lung abscess
 - 6.2.2.3 Tuberculosis
 - 6.2.2.4 Fungal infections
 - 6.2.2.5 Bronchial asthma
 - 6.2.2.6 Chronic bronchitis, emphysema and cor-pulmonale
 - 6.2.2.7 Cystic fibrosis
 - 6.2.2.8 Pulmonary eosinophilia
 - 6.2.2.9 Bronchiectasis (including its postural drainage management)
 - 6.2.2.10 Pulmonary oedema (cardiogenic and non-cardiogenic including ARDS)
 - 6.2.2.11 Interstitial lung disease (including fibrosingalveolitis, extrinsic alveolitis, lung fibrosis, sarcoidosis and pneumoconiosis)

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- 6.2.2.12 Carcinoma lung and other neoplasms
- 6.2.2.13 Mediastinal masses
- 6.2.2.14 Pleural diseases(e.g.,drypleurisy, pleural effusion,empyema)
- 6.2.2.15 Pneumothorax
- 6.2.2.16 Sleepapnoea syndrome
- 6.2.2.17 Acute and chronic respiratory failure

6.3 Hematology

- 6.3.1 Physiology and pathophysiology of bloodcell formation and haemostasis
- 6.3.2 Pathophysiology, causes and management of:
 - 6.3.2.1 Anaemia: iron deficiency (with iron metabolism), megaloblastic, haemolytic anaemia and aplastic anaemia
 - 6.3.2.2 Haemoglobinopathy and Polycythemia
 - 6.3.2.3 Leukaemia: myeloid (acute and chronic) and lymphoid (acute and chronic)
 - 6.3.2.4 Myeloproliferative diseases
 - 6.3.2.5 PV(Polycythemia Vera)
 - 6.3.2.6 Myelofibrosis
 - 6.3.2.7 Essential thrombocytosis
 - 6.3.2.8 Bleeding Disorders
 - 6.3.2.9 Plateletes Disorders
 - 6.3.2.10 Lymphomas: Hodgkin's and NonHodgkin's
- 6.3.3 Explain the underlying principles and complications of:
 - 6.3.3.1 Blood Transfusion, Blood group and Rh factor, Principles of cross match, Hazards of transfusion, Blood-platelets component, Bone MarrowTransplantation
 - 6.3.3.2 Infectious and Tropicaldiseases
- 6.3.4 Understanding of the following procedures:
 - 6.3.4.1 Peripheral blood smear
 - 6.3.4.2 Splenicaspiration
 - 6.3.4.3 Z- N staining
 - 6.3.4.4 Gram's staining
 - 6.3.4.5 Bone marrow examination
 - 6.3.4.6 Stool examination
 - 6.3.4.7 Aldehyde test
 - 6.3.4.8 Liver biopsy
- 6.3.5 Microbiological aspects of various infectious disease
- 6.3.6 Underlying pathogenesis of various infectious/tropical disorders
- 6.3.7 Basic pharmacokinetics of drugs used for treatment of tropical and infectious diseases
- 6.3.8 Diagnose and manage following emergencies:
 - 6.3.8.1 Septicemia, septic shock
 - 6.3.8.2 Cerebral malaria/black waterfever
 - 6.3.8.3 Tetanus/gasgangrene
 - 6.3.8.4 Acute viral encephalitis
 - 6.3.8.5 Hepatic Encephalopathy
 - 6.3.8.6 Enteric Encephalopathy
 - 6.3.8.7 HIV&AIDS

6.4 Rheumatology

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- 6.4.1 Common clinical presentations of rheumatic disease
- 6.4.2 Systemic perspective of rheumatic diseases in different systems
- 6.4.3 Genetics and rheumatic diseases
- 6.4.4 Inflammatory arthritides (RA, SpA, crystal arthritis and others)
- 6.4.5 Infection and joints (Septic arthritis and others)
- 6.4.6 Connective tissue diseases (SLE, systemic sclerosis and others)
- 6.4.7 Vasculitides
- 6.4.8 Diseases of bones and cartilages (osteoarthritis, osteoporosis and others)
- 6.4.9 Regional musculoskeletal pain syndromes
- 6.4.10 Miscellaneous conditions (autoinflammatory diseases, sarcoidosis & others)
- 6.4.11 Bone marrow aspiration
- 6.4.12 Bone marrow biopsy
- 6.4.13 Z-N staining
- 6.4.14 Muscle biopsy
- 6.4.15 Skin biopsy
- 6.4.16 Arthrocentesis
- 6.4.17 Intra-articular injections
- 6.4.18 Anatomical and physiological aspects of joints muscle and blood vessels in relation to rheumatologic conditions
- 6.4.19 Basis of cellular and humoral immune response, autoimmunity and gene therapy in rheumatological disorders
- 6.4.20 Interpret the results of various tests such as LE cell, ANF, anti-dsDNA, electrophoresis, complement system
- 6.4.21 Analysis of synovial fluid
- 6.4.22 Interpret the X-ray findings of bones and joints
- 6.4.23 Interpretation of the results of:
 - 6.4.23.1 Muscle biopsy
 - 6.4.23.2 Skin biopsy
 - 6.4.23.3 Kidney biopsy
- 6.4.24 To diagnose and manage rheumatologic emergencies
- 6.5 **Endocrinology and metabolic diseases**
 - 6.5.1 Understanding of the following procedures:
 - 6.5.1.1 Arterial puncture for blood gas analysis
 - 6.5.1.2 Use of glucometer and stripes for blood sugar
 - 6.5.1.3 Urine examination for sugar, Ketones, Specific gravity
 - 6.5.2 Interpret the findings of the following procedures/tests:
 - 6.5.2.1 Arterial blood gas analysis
 - 6.5.2.2 Pulse oximetry
 - 6.5.2.3 Thyroid function tests
 - 6.5.2.4 Pituitary function tests
 - 6.5.2.5 Parathyroid function tests
 - 6.5.2.6 Adrenal gland function tests
 - 6.5.2.7 G.T.T
 - 6.5.2.8 Sex hormone analysis
 - 6.5.2.9 Plain X-ray of various parts concerned
 - 6.5.3 Interpret the finding of:
 - 6.5.3.1 FNAC report of thyroid gland
 - 6.5.3.2 CT scan reports of various endocrine organs

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- 6.5.4 Diagnose and manage following emergencies:
 - 6.5.4.1 D.K.A. and coma and hyperosmolar non ketotic coma
 - 6.5.4.2 Hypoglycaemia
 - 6.5.4.3 Thyroid crisis
 - 6.5.4.4 Myxoedema coma
 - 6.5.4.5 Pheochromocytoma
 - 6.5.4.6 Hypopituitarism
 - 6.5.4.7 Hypocalcaemia
 - 6.5.4.8 Acute adrenocortical crisis
 - 6.5.4.9 Hypopituitarism
- 6.5.5 Explain the structural and functional basis:
 - 6.5.5.1 Various endocrine glands, homeostatic control mechanism of hormone regulation, and the genetic basis of various endocrine disorders

7. **Cardiology**

- 7.1 Diagnose order and interpret appropriate investigations and manage the following clinical conditions:
 - 7.1.1 Acute Rheumatic Fever
 - 7.1.2 Valvular heart disease: rheumatic and non-rheumatic
 - 7.1.3 Common congenital heart diseases
 - 7.1.4 Hypertension and hypertensive heart disease
 - 7.1.5 Ischaemic heart disease:
 - 7.1.5.1 Stable and unstable angina
 - 7.1.5.2 Acute myocardial infarction
 - 7.1.6 Cardiomyopathies: dilated cardiomyopathy, hypertrophic cardiomyopathy, restrictive cardiomyopathy
 - 7.1.7 Pericardial diseases: pericarditis, pericardial effusion and constrictive pericarditis
 - 7.1.8 Diseases of great arteries: coarctation of aorta, aortitis, aneurysm
 - 7.1.9 Deep vein thrombosis: thromboembolism & pulmonary embolism
 - 7.1.10 Arrhythmias
 - 7.1.10.1 Bradyarrhythmia (SA, AV blocks)
 - 7.1.10.2 Tachyarrhythmias (SVT, VT, VF, WPW, AF, AVF)
 - 7.1.10.3 Infective Endocarditis
- 7.2 Interpret the investigative of following procedures:
 - 7.2.1 ECG with various arrhythmias
 - 7.2.2 Stress electrocardiomyopathy
 - 7.2.3 Echocardiogram of common acquired and congenital heart disease
 - 7.2.4 Cardiac enzymes, pericardial fluid analysis
- 7.3 Diagnose and manage
 - 7.3.1 Pulmonary oedema and cardiogenic shock
 - 7.3.2 Dyslipidaemias
 - 7.3.3 Cor pulmonale and pulmonary arterial hypertension
 - 7.3.4 Electrolyte imbalance
 - 7.3.5 Basic science applied to cardiology
 - 7.3.6 Fetal circulation
 - 7.3.7 Coronary circulation
 - 7.3.8 Pulmonary circulation
 - 7.3.9 Embryogenesis of congenital heart diseases

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- 7.3.10 Valvular apparatus
- 7.3.11 Conduction system
- 7.3.12 Pharmacology of cardiac drugs
- 7.3.13 Exercisephysiology
- 7.3.14 Etiopathogenesis and pathophysiology of various cardiac diseases in relation to clotting system, lipid abnormalities, infectious diseases
- 7.3.15 Hemodynamics (exercise, high altitude, metabolic and hormonal disorders, fetal circulation)

8. **Neurology**

- 9.1 Perform following procedures independently:
 - 9.1.1 Lumbar puncture
 - 9.1.2 Intrathecal injection
 - 9.1.3 Administration of IV contrastagent
- 9.2 Understanding of the following procedures
 - 9.2.1 EEG, EMG, Nerve conduction studies
- 9.3 Interpretation of the findings of:
 - 9.3.1 CT scan / MRI scan of:
 - 9.3.1.1 Subdural haematoma
 - 9.3.1.2 Intracranial haemorrhage including subarachnoid haemorrhage
 - 9.3.1.3 Infarction
 - 9.3.1.4 Obstructive hydrocephalus
 - 9.3.2 Myelogram:
 - 9.3.2.1 Complete obstruction
 - 9.3.2.2 Intramedullary compression
 - 9.3.2.3 Extramedullary compression
 - 9.3.3 Interpretation of the results of:
 - 9.3.3.1 Muscle biopsy
 - 9.3.3.2 Nerve biopsy
 - 9.3.3.3 EEG
 - 9.3.3.4 EMG
 - 9.3.3.5 Nerve conduction study
 - 9.3.3.6 Carotid and vertebral angiogram
 - 9.3.3.7 CT myelography
- 9.4 Diagnose and management the following neurological emergency:
 - 9.4.1 CVA including subarachnoid haemorrhage
 - 9.4.2 Meningitis
 - 9.4.3 Encephalitis
 - 9.4.4 Unconscious patient
 - 9.4.5 Status epilepticus
 - 9.4.6 Myastheniagravis
 - 9.4.7 Increased Intracranial pressure
 - 9.4.8 Guillain–Barre syndrome
 - 9.4.9 Hypoxicencephalopathy

9. **Oncology**

- 10.1 Etiopathogenesis of cancer
- 10.2 Epidemiology of cancer
- 10.3 Cancer prevention & screening

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- 10.4 Diagnosis & diagnostic tools in cancer
 - 10.5 Principles of cancer management
 - 10.6 Common cancers: Oesophagus, stomach, colorectum, hepatocellular cancer, cancers of the biliary tree, pancreas, breast, lung, renal cell carcinoma, prostate, testicular, GIST, ovarian, endometrial, hematological & lymphoid malignancies, cancers of the endocrine system, HIV-associated cancers, tumors of the mediastinum etc
 - 10.7 Oncological emergencies & paraneoplastic syndromes
 - 10.8 Anticancer therapeutics
10. **Dermatology**
- 11.1 Scabies
 - 11.2 Superficial mycoses
 - 11.3 Superficial bacterial infections
 - 11.4 Diagnosis and management of drug induced cutaneous eruptions
11. **Psychiatry**
- 12.1 Diagnose anxiety neurosis, depression and schizophrenia
 - 12.2 Differentiate between functional and organic psychoses (simple and uncomplicated)
 - 12.3 Treat cases of anxiety neurosis and depression
 - 12.4 Diagnose and manage substance abuse

SECTION (B) NEPHROLOGY - 55 MARKS

1. Normal structure and function of kidneys

- Embryology of the kidney
- Anatomy of the kidney
- The renal circulation and glomerular ultrafiltration
- Metabolic basis of solute transport
- Transport of sodium, chloride, and potassium
- Aldosterone regulation of ion transport
- Transport of calcium, magnesium and phosphate
- Renal handling of organic solutes
- Renal acidification mechanisms
- Urine concentration and dilution
- The cell biology of vasopressin action
- Vasoactive molecules and the kidney
- Arachidonic acid metabolites and the kidney

2. Disorders of body fluid volume and composition

- Disorders of sodium balance
- Disorders of water balance
- Disorders of acid base balance
- Disorders of potassium balance

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- Disorders of calcium, magnesium and phosphate balance

3. Epidemiology and risk factors in kidney disease

- Epidemiology of kidney disease
- Demographics of kidney disease
- Risk factors and chronic kidney disease
- Nephron endowment
- Aging and kidney disease

4. Evaluation of a patient with a kidney disease

- Approach to a patient with a kidney disease
- Laboratory assessment of kidney disease: glomerular filtration rate (GFR), urinalysis, proteinuria
- Interpretation of electrolytes and acid base parameters in blood and urine
- Diagnostic kidney imaging
- The renal biopsy
- Biomarkers in acute and chronic kidney diseases

5. Disorders of kidney structure and function

- Acute kidney injury
- Primary glomerular disease
- Secondary glomerular disease
- Overview of therapy of glomerular disease
- Microvascular and macrovascular diseases of the kidneys
- Tubulointerstitial diseases
- Urinary tract infections in adults
- Urinary tract obstruction
- Diabetic nephropathy
- Nephrolithiasis
- Renal neoplasia
- Renal disease in cancer patients

6. Genetics of kidney diseases

- Genetic basis of kidney disease
- Inherited disorders of the glomerulus
- Inherited disorders of the renal tubule

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- Cystic diseases of the kidneys

7. Hypertension and the kidney

- Primary and secondary hypertension
- Renovascular hypertension and ischaemic nephropathy
- Hypertension and kidney disease in pregnancy
- Antihypertensive drugs
- Diuretics

8. The consequences of advanced kidney disease

- Adaptation of nephron loss and mechanisms of progression in chronic kidney disease
- Mechanisms and consequences of proteinuria
- The pathophysiology of uraemia
- Chronic kidney disease-mineral bone disorder
- Cardiovascular aspects of kidney disease
- Haematologic aspects of kidney disease
- Endocrine aspects of chronic kidney disease
- Neurologic aspects of chronic kidney disease
- Dermatologic conditions in kidney disease

9. Conservative management of kidney disease

- Dietary approaches to kidney diseases
- Stepped care approach to the management of chronic kidney disease
- Vitamin D, calcimimetic agents and phosphate binders
- Prescribing drugs in kidney disease

10. Dialysis and extracorporeal therapies

- Hemodialysis
- Peritoneal dialysis
- Critical care nephrology
- Plasmapheresis
- Extracorporeal treatment of poisoning
- Interventional nephrology

11. Kidney transplantation

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- Transplantation immunobiology
- Donor and recipient issues
- Clinical management

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