पाटन स्वास्थ्य विज्ञान प्रतिष्ठान, सेवा आयोग

प्राज्ञिक सेवा, ईन्टर्नल मेडिसिन समूह, सह-प्राध्यापक पद, दशौं (१०) तहको

खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

Paper II: Technical Subject

Section (A) - 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 Motor system: structure, corticospinal, rubrospinal, vestibulospinal and reticulospinal tracts
1.1.6 Basal ganglia: structure
1.1.7 Cerebellum: morphology, cellular structure and organization
1.1.8 Brain stem: general organization
1.1.9 Spinal cord and ganglia: morphology, motor and sensory organization in the spinal cord
1.1.10 Anatomy of neuro-muscular system
1.1.10.1 LMN, structuring of voluntary muscles, motor units, types of muscle fibres
1.1.10.2 Muscle spindles and other muscles & tendon receptors
1.1.11 Sensory system
1.1.12 Reflex pathways: involving cranial nerves, and limb and trunk
1.1.13 Cranial nerves and special senses: pathways and structure of special sense organs
1.1.14 Anatomy of ventricular system and CSF production
1.1.15 Anatomy of menenges
1.1.16 Autonomic nervous system
1.1.17 Arterial and venous cerebral circulation
1.1.18 Blood brain barrier

1.2 Pulmonology

1.2.1 Gross anatomy of upper and lower respiratory tracts, lungs with lobes and fissures with surface marking
1.2.2 Concept of bronchopulmonary segments and lobule or acinus supplied by a terminal bronchiole
1.2.3 Histology of alveolar lining cells
1.2.4 Pulmonary vascular bed
1.2.5 Pleura and pleural space, functions and histology
1.2.6 Mediastinum and their structures
1.2.7 Thoracic cage and primary and secondary muscles of respiration
1.2.8 The diaphragm its attachments, nerve supply and function
1.2.9 Lymphatic drainage of lungs and pleura
1.2.10 Innervation of the lungs.
1.2.11 Thoracic recptors.

1.3 Cardiovascular system

1.3.1 Gross anatomy of the heart and circulatory system
1.3.2 Histology of the cardiac muscles

1.3.3 Embryology of the heart and circulation
1.3.4 Coronary and pulmonary circulation

1.4 Gastrointestinal tract

1.4.1 Gross anatomy of the gastrointestinal tract at different levels.
1.4.2 Gross anatomy of the hepatobiliary system and pancreas.
1.4.3 Histological aspects of GI tract at different levels.
1.4.4 Blood supply and development aspects of GI tract and hepatobiliary system

1.5 Kidney and urinary tract

1.5.1 Gross anatomy of the kidney and urinary tract
1.5.2 Structure of nephron and function at different level
1.5.3 Development of kidney and urinary tract
1.5.4 Renal circulation

1.6 Endocrinal organs

1.6.1 Gross anatomy of different endocrinal organs and their development
1.6.2 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/macromolecular, organelles and other structures of the cell
2.4 Nutritional requirements of normal people (different ages, male, female) and ill patients of all catagories 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 haemostais, 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 Neurotransmitters, 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
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)

Section (B) - 55 Marks

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

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 respiratiory stimulants

4.6 Reproductive/Endocrine systems

4.6.1 Antidiabetics, thyroid and antithroid 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, anthelmintnic, antifungal, and antiviral drugs

4.9 Micellaneous 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. Principles and Practice of Internal Medicine

5.1 Gastroenterology

5.1.1 Acid peptic diseases

5.1.2 Gastrointestinal bleeding: upper (non variceal/variceal) and lower

5.1.3 Gastro oesophagial reflux disease (GERD)

5.1.4 Dysphagia in relation to malignancy and achalasia

5.1.5 Malabsorption syndrome

5.1.6 IBD: ulcerative colitis and Crohn's disease

5.1.7 Diverticular diseases

5.1.8 Irritable bowel syndrome

5.1.9 Acute abdomen

5.1.10 Ascites

5.1.11 Liver disorders
5.1.11.1Hepatitis: acute and chronic
5.1.11.2Cirrhosis with special reference
5.1.11.2.1 Hepatic cellular cancer
5.1.11.2.2 Jaundice: obstructive and non obstructive
5.1.11.3Liver failure: acute and chronic
5.1.12 Pancreas
5.1.12.1Acute, recurrent & chronic pancreatitis
5.1.12.2Pancreatic tumor (exocrine & endocrine)
5.1.12.3Cystic fibrosis & other childhood disorder of the pancreas
5.1.12.4Heriditary pancreatitis
5.1.12.5Pancreatic transplantation

5.2 Respiratory Medicine

5.2.1 Anatomy and applied physiology of the respiratory system
5.2.2 Understanding of basic pathophysiology and be able to manage the disease processes mentioned below considering the relevant differential diagnosis:
5.2.2.1 Pneumonias
5.2.2.2 Lung abscess
5.2.2.3 Tuberculosis
5.2.2.4 Fungal infections
5.2.2.5 Bronchial asthma
5.2.2.6 Chronic bronchitis, emphysema and cor-pulmonale:
5.2.2.7 Cystic fibrosis
5.2.2.8 Pulmonary eosinophilia
5.2.2.9 Bronchiectasis (including its postural drainage management)
5.2.2.10 Pulmonary oedema (cardiogenic and non-cardiogenic including ARDS)
5.2.2.11 Interstitial lung disease (including fibrosing alveolitis, extrinsic alveolitics, lung fibrosis, sarcoidosis and pneumoconiosis)
5.2.2.12 Carcinoma lung and other neoplasms
5.2.2.13 Mediastinal masses
5.2.2.14 Pleuraldiseases (e.g. dry pleurisy, pleural effusion, empyema):
5.2.2.15 Pneumothorax
5.2.2.16 Sleep apnoea syndrome
5.2.2.17 Acute and chronic respiratory failure

5.3 Hematology

5.3.1 Physiology and pathophysiology of blood cell formation and haemostasis
5.3.2 Pathophysiology, causes and management of :
5.3.2.1 Anaemia: iron deficiency (with ironmetabolism), megaloblastic, haemolytic anaemia and aplastic anaemia
5.3.2.2 Haemoglobinopathy and Polycythemia
5.3.2.3 Leukaemia: myeloid (acute and chronic) and lymphoid (acute and chronic)
5.3.2.4 Myeloproliferative diseases
5.3.2.4.1 PV (Polycythemia Vera)
5.3.2.4.2 Myelofibrosis
5.3.2.4.3 Essential thrombocytosis

5.3.2.5 Bleeding Disorders
5.3.2.6 Plateletes Disorders
5.3.2.7 Lymphomas: Hodgkin's and Non Hodgkin
5.3.2.8 Explain the underlying principles and complications of:
5.3.2.8.1 Blood Transfusion
5.3.2.8.1.1 Blood group and Rh factor
5.3.2.8.1.2 Principles of cross match
5.3.2.8.1.3 Hazards of transfusion
5.3.2.8.1.4 Blood – platelets component
5.3.2.8.2 Bone Marrow Transplantation

5.4 Infectious and Tropical diseases

5.4.1 Understanding of the following procedures:
5.4.1.1 Peripheral blood smear
5.4.1.2 Splenic aspiration
5.4.1.3 Z – N staining
5.4.1.4 Gram's staining
5.4.1.5 Bone marrow examination
5.4.1.6 Stool examination
5.4.1.7 Aldehyde test
5.4.1.8 Liver biopsy
5.4.2 Microbiological aspects of various infectious disease
5.4.3 Underlying pathogenesis of various inflectious/ tropical disorders
5.4.4 Basic pharmacokinetics of drugs used for treatment of tropical and infectious diseases
5.4.5 Diagnose and manage following emergencies:
5.4.5.1 Septicemia, septic shock
5.4.5.2 Cerebral malaria/black water fever
5.4.5.3 Tetanus/gas gangrene
5.4.5.4 Acute viral encephalitis
5.4.5.5 Hepatic Encephalopathy
5.4.5.6 Enteric Encephalopathy
5.4.5.7 HIV & AIDS

5.5 Rheumatology

5.5.1 Bone marrow aspiration
5.5.2 Bone marrow biopsy
5.5.3 Z-N staining
5.5.4 Muscle biopsy
5.5.5 Skin biopsy
5.5.6 Arthro centesis
5.5.7 Intra – articular injections
5.5.7.1 Anatomical and physiological aspects of joints muscle and blood vessels in relation to rheumatologic conditions
5.5.7.2 Basis of cellular and humoral immune respone, autoimmunity and genetherapy in rheumatological disorders
5.5.7.3 Interpret the results of various tests such as LE cell, ANF anti-ds DNA, electrophoresis, complement system
5.5.7.4 Analysis of synovial fluid

5.5.7.5 Interpret the X-ray findings of bones and joints
5.5.7.6 Interpretation of the results of :
5.5.7.6.1 Muscle biopsy
5.5.7.6.2 Skin biopsy
5.5.7.6.3 Kidney biopsy
5.5.7.7 To diagnose and manage the following rheumatology emergency :
5.5.7.7.1 Vasculitis
5.5.7.7.2 SLE with crisis

5.6 Endocrinology and metabolic diseases

5.6.1 Understanding of the following procedures:
5.6.1.1 Arterial puncture for blood gas analysis
5.6.1.2 Use of glucometer and stripes for blood sugar
5.6.1.3 Urine examination for sugar, Ketones, Specific gravity
5.6.2 Interpret the findings of the following procedures/tests:
5.6.2.1 Arterial blood gas analysis
5.6.2.2 Pulse oximetry
5.6.2.3 Thyroid function tests
5.6.2.4 Pituitary function tests
5.6.2.5 Parathyroid function tests
5.6.2.6 Adrenal gland function tests
5.6.2.7 G.T.T
5.6.2.8 Sex harmony analysis
5.6.2.9 Plain X-ray of various parts concerned
5.6.3 Interpret the finding of :
5.6.3.1 FNAC report of thyroid gland
5.6.3.2 CT Scan reports of various endocrine organs
5.6.4 Diagnose and manage following emergencies :
5.6.4.1 D.K.A. and coma and hyperosmolar non ketotic coma
5.6.4.2 Hypoglycaemia
5.6.4.3 Thyroid crisis
5.6.4.4 Myxoedema coma
5.6.4.5 Phaeochromocytoma
5.6.4.6 Hypopituitarism
5.6.4.7 Hypocalcaemia
5.6.4.8 Acute adrenocortical crisis
5.6.4.9 Hyperpituitarism
5.6.5 Explain the structural and functional basis:
5.6.5.1 Various endocrine glands, homeostatic control mechanism of hormone regulation, and the genetic basis of various endocrine disorders

5.7 Cardiology

5.7.1 Diagnose, order and interpret appropriate investigations and manage the following clinical conditions:
5.7.1.1 Acute Rheumatic Fever
5.7.1.2 Valvular heart disease: rheumatic and non- rheumatic
5.7.1.3 Common congenital heart diseases
5.7.1.4 Hypertension and hypertensive heart disease

5.7.1.5 Ischaemic heart disease:
5.7.1.5.1 Stable and unstable angina,
5.7.1.5.2 Acute myocardial infraction
5.7.1.6 Cardomyopathies: dilated cadiomyopathy, hypertropic cardiomyopathy, restrictive cardiomyopathy
5.7.1.7 Pericardial diseases: pericarditis, pericardial effusion and constrictive pericarditis
5.7.1.8 Diseases of great arteries: coarctation of aorta, aortitis, aneurysm
5.7.1.9 Deep vein thrombosis: thromboembolism & pulmonary embolism
5.7.1.10 Arrhythmias
5.7.1.10.1Bradyarrhythmia (SA, AV blocks)
5.7.1.10.2Tachyarrythmia (SVT, VT, VF, WPW, AF, AVF)
5.7.1.10.3 Infective Endocarditis
5.7.2 Interpret the investigative of following procedures:
5.7.2.1 ECG with various arryhythmia
5.7.2.2 Stress electrocardiomyopathy
5.7.2.3 Echocardiogram of common acquired and congenital heart disease
5.7.2.4 Cardiac enzymes, pericardial fluid analysis
5.7.3 Diagnose and manage
5.7.3.1 Pulmonary oedema and cardiogenic shock
5.7.3.2 Dyslipidaemias
5.7.3.3 Corpulmonale and pulmonary arterioal hypertension
5.7.3.4 Electrolytes imbalance
5.7.4 Basic science applied to cardiology
5.7.4.1 Fetal circulation
5.7.4.2 Coronary circulation
5.7.4.3 Pulmonary ciruculation
5.7.4.4 Embryogenesis of congenital heart diseases
5.7.4.5 Valvular apparatus
5.7.4.6 Conduction system
5.7.4.7 Pharmacology of cardiac drugs
5.7.4.8 Exercise physiology
5.7.4.9 Etiopathogenesis and pathophysiology of various cardiac diseases in relation to clotting system, lipid abnormalities, infectious diseases
5.7.4.10 Hemodynamics (exercise, high altitude, metabolic and hormonal disorders, fetal circulation)

5.8 Nephrology

5.8.1 Diagnose, investigate and treatment of following renal emergencies:
5.8.1.1 Acute renal failure
5.8.1.2 Renal colic
5.8.1.3 Haematuria
5.8.1.4 Fluid, electrolyte and acid-basic imbalance
5.8.2 Diagnose, investigate and treatment of following common renal diseases:
5.8.2.1 Acute glomerulonephritis
5.8.2.2 Nephrotic syndrome
5.8.2.3 Urinary tract infection

5.8.2.4 Chronic renal failure
5.8.2.5 Adult polycystic kidney disease, Alperts syndrome
5.8.2.6 Diabetic Nephropathy
5.8.2.7 Renal tubular acidosis (RTA)
5.8.2.8 Interstitial Nephropathy
5.8.2.9 Toxic Nephropathy
5.8.2.10 Lupus Nephritis
5.8.2.11 Nephrocalcinosis and Nephrolithiasis
5.8.2.12 Renal artey stenosis (RAS)
5.8.3 Interpret investigationsof :
5.8.3.1 Renal function test (RFT)
5.8.3.2 Blood gas analysis
5.8.3.3 Renal biopsy report
5.8.4 Basic principles of haemodialysis and peritoneal dialysis and their specific indiacions

5.9 Neurology

5.9.1 Perform following procedures independently:
5.9.1.1 Lumbar puncture
5.9.1.2 Intrathecal injection
5.9.1.3 Administration of IV contrast agent
5.9.2 Understanding of the following procedures
5.9.2.1 EEG, EMG, Nerve conduction studies
5.9.3 Interpretation of the findings of:
5.9.3.1 CT scan / MRI scan of:
5.9.3.1.1 Subdural haematoma
5.9.3.1.2 Intracranial haemorrhage including – subarachnoid haemorrhage
5.9.3.1.3 Infarction
5.9.3.1.4 Obstructive hydrocephalus
5.9.3.2 Myelogram :
5.9.3.2.1 Complete obstruction
5.9.3.2.2 Intramedullary compression
5.9.3.2.3 Extramedullary compression
5.9.4 Interpretation of the results of:
5.9.4.1 Muscle biopsy
5.9.4.2 Nerve biopsy
5.9.4.3 EEG
5.9.4.4 EMG
5.9.4.5 Nerve conduction study
5.9.4.6 Carotid and vertebral angiogram
5.9.4.7 CT myelography
5.9.5 Diagnose and management the following neurological emergency:
5.9.5.1 CVA including subarachnoidhaemorrhage
5.9.5.2 Meningitis
5.9.5.3 Encephalitis
5.9.5.4 Unconscious patient
5.9.5.5 Status epilepticus

5.9.5.6 Myasthenia gravis
5.9.5.7 Increased Intracranial pressure
5.9.5.8 Gullainie – Barry syndrome
5.9.5.9 Hypoxic encephalopathy

5.10 Oncology

5.11 Dermatology

5.11.1 Scabies
5.11.2 Superficial mycoses
5.11.3 Superficial bacterial infections
5.11.4 Diagnosis and management of drug induced cutaneous eruptions

5.12 Psychiatry

5.12.1 Diagnose anxiety neurosis, depression and schizophrenia
5.12.2 Differentiate between functional and organic psychoses (simple and uncomplicated)
5.12.3 Treat cases of anxiety neurosis and depression
5.12.4 Diagnose and manage substance abuse.

6. Recent Advances in Internal Medicine and Emergencies

6.1 Cardiovascular emergencies: Cardiac arrest, Acute MI, Cariogenic shock, Cardiac arrhythmias, Pulmonary edema, Hypertensive crisis, Acute cardiac tamponade, DVT & pulmonary embolism
6.2 Respiratory emergencies: Hemoptysis, Acute respiratory failure, Pneumothorax, Status asthmaticus, ARDS
6.3 Gastrointestinal emergencies: G.I. bleeding, Acute gastroenteritis and food poisoning, Acute pancreatitis, Hepatic failure, Acute abdomen
6.4 Neurological emergencies: CVA including SAH, Hypertensive encephalopathy, Meningitis, Encephalitis, Unconscious patient, Status epilepticus, Myasthenia gravis
6.5 Endocrine and metabolic emergencies: DKA and coma, Hypoglycemia, Hyperosmolar nonketotic diabetic coma, Thyroid crisis, Myxoedema coma, Pheochromocytoma, Acute adrenocortical crisis, Hypopituitarism
6.6 Hematological emergencies: Aplastic anaemia, Agranulocytosis, Acute thromocythpenic purpur, Leukemia, Hemophilia and allied disorders
6.7 Renal emergencies: Renal colic, Renal failure, Hematuria

6.8 Miscellaneous emergencies:

6.8.1 Emergencies in fluid and electrolyte balance
6.8.2 Acute emergencies in infectious and tropical disease
6.8.3 Malaria
6.8.4 Septicemia
6.8.5 Tetanus
6.8.6 Snake bite
6.8.7 Dog bite & rabies
6.8.8 Poisonings
6.8.9 Drowning
6.8.10 Electrocution
6.8.11 High altitude sickness

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