पाटन स्वास्थ्य विज्ञान प्रतिष्ठान, सेवाआयोग

प्राज्ञिक सेवा, ईन्टर्नल मेडिसिन समूह, Endocrinology उपसमूह, सहायक प्राध्यापक पद,

(९ख) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

Paper II: Technical Subject

Section (A) - 45 Marks

(1 critical analysis Q -15 mark + 3 long Q- 30 marks)

INTERNAL MEDICINE

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 fissureswith surface marking
1.3.2 Concept of bronchopulmonary segments and lobule or acinus aerated by aterminal 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

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 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 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
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-pathogenicmicro-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-narcoticanalgesics, non-steroidalanti-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 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, anthelminthic, 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, Cariogenic 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
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

Section (B) - 55 Marks
(1 critical analysis Q -15 marks + 4 long Q -40 marks)

Endocrinology

1. Principles of Endocrinology
2. Genetic control of peptide hormone formation
3. Mechanism of Hormones
4. Laboratory techniques for recognition of endocrine disorders
5. Hypothalamus and pituitary
    a. Neuroendocrinology
    b. Pituitary physiology and diagnostic evaluation
    c. Pituitary masses and tumors
    d. Posterior pituitary
6. Thyroid
    a. Thyroid physiology and diagnostic evaluation of patients with thyroid disorders
    b. Thyrotoxicosis
    c. Hypothyroidism and thyroiditis
    d. Nontoxic diffuse and nodular goiter and thyroid neoplasia
7. Adrenal cortex and endocrine hypertension
8. Reproduction
    a. Physiology and pathology of the female reproductive axis
    b. Hormonal contraception
    c. Testicular disorders
    d. Sexual dysfunction in male and female
9. Endocrinology and lifespan
    a. Endocrine changes in pregnancy
    b. Endocrinology of foetal development
    c. Disorders of sex development
    d. Normal and aberrant growth
    e. Puberty: ontology, neuroendocrinology, physiology, and disorders
    f. Hormones and athletic performance
    g. Endocrinology of aging
10. Mineral metabolism
    a. Hormones and disorders of mineral metabolism
    b. Metabolic bone disease
    c. Kidney stones

11. Disorders of carbohydrate metabolism
    a. Type 2 diabetes mellitus
    b. Type 1 diabetes mellitus
    c. Complications of diabetes mellitus
    d. Hypoglycaemia
12. Body fat and lipid metabolism
    a. Neuroendocrine control of energy stores
    b. Obesity
    c. Disorders of lipid metabolism
    d. Endocrinology of HIV/AIDS
    e. Gastrointestinal hormones and gut endocrine tumors
13. Polyendocrine and neoplastic disorders
    a. Pathogenesis of endocrine tumors
    b. Multiple endocrine neoplasia
    c. Immunoendocrinopathy syndromes
    d. Endocrine management of cancer survivor
    e. Neuroendocrine gastrointestinal and lung tumors, carcinoid syndrome, and related disorders
14. Endocrine Emergencies

Following pattern will be used for formation of paper I & II as far as possible.

Paper I				
Part	**Section**	**Weightage**	**No. Questions & Weightage**	
			Objective Multiple Choice	**Subjective**
I	A	20		2 Questions x 10 Mark = 20
	B	30		3 Questions x 10 Mark = 30
II	C	25	25 Questions x 1 Mark = 25	
	D	25	25 Questions x 1 Mark = 25	
Paper II				
Section		**Weightage**	**No. Questions & Weightage**	
			Long answer	**Critical Analysis**
A		45	3 Questions x 10 Mark = 30	1 Questions x 15 Mark = 15
B		55	4 Questions x 10 Mark = 40	1 Questions x 15 Mark = 15

**** The end ****