COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

FCPS PART-I

PATHOLOGY

CURRICULUM

2023

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The College of Physicians and Surgeons Pakistan would appreciate any criticism, suggestions, advice from the readers and users of this document. Comments may be sent in writing or by e-mail to the CPSP at:

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CONTENTS

ABOUT THE COLLEGE

The College was established in 1962 through an ordinance of the Federal Government. The objectives/functions of the College include promoting specialist practice of Medicine, Obstetrics & Gynaecology, Surgery and other specialties by securing improvement of teaching and training, arranging postgraduate medical, surgical and other specialists training, providing opportunities for research, holding and conducting examinations for awarding College diplomas and admission to the Fellowship of the College.

Since its inception, the College has taken great strides in improving postgraduate medical & dental education in Pakistan. Competency-based structured Residency Programs have now been developed, along with criteria for accreditation of training institutions, and for the appointment of supervisors & examiners. The format of examinations has evolved over the years to achieve greater objectivity and reliability in methods of assessment. The recognition of the standards of College qualifications nationally & internationally, particularly of its Fellowships, has enormously increased the number of trainees and consequently the number of training institutions and the supervisors. The rapid increase in knowledge base of medical sciences & consequent emergence of new subspecialties have gradually increased the number of CPSP fellowship disciplines to eighty one including specialties in dentistry.

The first step in the organization of postgraduate medical and dental education is to select those students who demonstrate that they have adequate fund of knowledge & aptitude to pursue postgraduate medical and dental education. CPSP at present has formulated 11 groups of similar specialties and has designed a curriculum for each of these groups. The format for the FCPS Part-I examination consists of two single best MCQ papers with a clinical scenario so as to test the application of knowledge of basic and clinical sciences learnt during undergraduate studies and Hence, it is treated as a screening test. But this test does not take into

account the aptitude of the candidates and Hence, CPSP allows the accredited institutes to ascerting it through penal of subject specialists for induction into each specialty.

This booklet covers the curriculum for surgical & allied specialties and provides guidance for the students as well as the examiners regarding the objectives, syllabus and examination format. The students aspiring to appear in FCPS Part-I examination or advised to go through this document while prepairing for the exam.

The postgraduate medical and dental education is a combination of learning experiences followed by some sort of test, formative or summative. The purpose of formative tests is to provide constructive feedback to coverup the deficiencies and hence are a powerful tool of learning after completing first two years of training during IMM, the trainees are allowed to proceed to the advance phase of FCPS training in the specific specialty of choice for 2-3 years. However, it is mandatory to qualify IMM examination before taking the FCPS-II exit examination.

The average number of candidates taking CPSP examinations each year is to a minimum of 32,000. The College conducts examinations for FCPS-I (11 groups of disciplines), IMM, FCPS-II (81 disciplines), MCPS (22 disciplines), including MCPS in Health Professions Education and Health Care System Management. A large number of Fellows and senior medical teachers from within the country and overseas are involved at various levels of examinations of the College.

The candidates who wants to pursue postgraduate medical or dental education are advised to select the specialty of their choice after collecting information about that specific specialty from their seniors or from those who have successfully completed the fellowship programme.

Prof. Khalid Masood Gondal
President
College of Physicians and Surgeon Pakistan

FCPS Part-I EXAMINATION

The College conducts FCPS Part-I examinations in the following disciplines:

1. Anaesthesiology
2. Community Medicine
3. Dentistry
4. Diagnostic Radiology
5. Medicine and Allied
6. Obstetrics & Gynaecology
7. Ophthalmology
8. Otorhinolaryngology (E.N.T)
9. Pathology
10. Psychiatry
11. Surgery and Allied

CPSP COMPETENCY MODEL

College of Physicians and Surgeons Pakistan has moved to competency-based medical education and has developed its own competency model shown below. Those who wish to pursue any fellowship programme of the college, should at the outset become aware of its training model. A generic explanation of the model is given below and it is expected that all its residency training programmes follow the components of this model in accordance to the requirements of each specialty.

Patient or population care occupies the pivotal center. Patient care includes all clinical skills such as history taking, physical examination, ordering investigations, making diagnoses and managing the care. The inner leaves of the model represent the five major competencies directly related to patient care, while the three competencies in the outer circle are mega-competencies related to patient care and also incorporate education, professionalism, leadership, advocacy and population health.

By the end of the Residency Programme, residents are expected to acquire these competencies and their constituent learning outcomes, and provide promotive, preventive, curative and rehabilitative patient-centered (or population-centered) care.

Inner Leaves:

1. Knowledge and Critical Thinking
2. Technical Skills
3. Communication Skills
4. Teamwork
5. Research

Outer Leaves:

6. Professionalism
7. Pedagogy
8. Advocacy

1. Knowledge and Critical Thinking

- Demonstrate application of wide and current readings to critical thinking and problem solving
- Relate the alteration of body function to the presenting condition
- Interpret and integrate history and examination findings to arrive at an appropriate provisional and credible differential diagnoses
- Sequentially order, justify and interpret appropriate investigations
- Apply knowledge and reasoning skills to
    - Analyze data for problem identification and to rule in and rule out contending conditions
    - Synthesize and evaluate solutions for decision-making in solving familiar and less familiar problems based on best current evidence
    - Prioritize different problems within a time frame.
    - Select, outline and provide, with evidence-based justifications, appropriate pharmacological and non-pharmacological management strategies
    - Assess new medical knowledge and apply it to resolve patient problems (Evidence-based practice)
    - Apply quality assurance procedures in daily work. (Professionalism)
    - Demonstrate shared-decision-making with the patient or family
    - Provide cost-effective care while ordering investigations and in management
    - Use resources appropriately
    - Demonstrate awareness of bio-psycho-social factors in assessment and management of a patient.

2. Technical Skills

- Demonstrate International Patient Safety Goals (IPSG)
- Demonstrate competent performance of all required technical skills and procedures in the specialty, including:
  - Obtaining informed consent
  - Preoperative planning
  - Pre-interventional care and preparation
  - Intra-Intervention technique including exposure and closure, global and task specific items, and communication and team skills
  - Post-interventional care
  - Follow-up Care.

3. Communication Skills

- Written Communication Skills
  - Maintain clear, concise, accurate and updated medical records
  - Write clear, focused, evidence-based and logical management plans and discharge summaries
  - Write respectful, clear and focused letters and referrals to other colleagues.
- Verbal Communication Skills: Demonstrate
  - Effective interpersonal communication skills: clear, considerate and sensitive towards patients, their relatives, other health professionals and the public, and towards students
  - Non-verbal communication skills:
  - Empathy and respect towards patients and their relatives
  - Effective counseling of the patient and the family with cultural sensitivity: explain options, educate them and promote joint decision-making.
  - Appropriate verbal and body language on the campus and all work situations including seminars, bedside sessions, outpatient sessions and others
  - Respect and tolerance for all health care professionals, including peers, juniors and seniors
  - Clear, focused and logical presentation of cases.

4. Teamwork

- Demonstrate constructive team-communication skills.
- Facilitate collaborative group interaction as a team member to build strong teams demonstrating respect, tolerance and interdependence.
- Support other team members to grow
- Demonstrate willingness to assume responsibility and leadership as needed.

5. Research

- Interpret and use results of various research studies (critical appraisal)
- Conduct a research study individually or in a group by using appropriate
- Selection of research question(s) and objectives
- Research design and statistical methods to answer the research question
- Ethical and R&RC approval of the synopsis
- Demonstrate competence in academic writing by writing an appropriate dissertation and/or publishing research article(s) as a step towards resolving issues or concerns in their specialty
- Guide others in conducting research by advising about research methodology including study designs and statistical methods
- Demonstrate clear, focused and logical presentations of their research.

6. Professionalism

- Demonstrate the highest level of personal integrity: honesty, punctuality, regularity, timely task completion
- Deal with all patients in a non-discriminatory, prejudice- free manner, demonstrating the same level of care for every human being irrespective of gender, age, ethnic background, culture, socioeconomic status and religion
- Establish a trusting relationship with patients, their relatives and care-givers
- Deal with all patients with honesty, empathy and compassion, putting patients' needs first (altruism)
- Facilitate transfer of information important for promotion of

health, prevention and management of disease
- Encourage questioning by the patient and be receptive to feedback
- Pursue self-directed and life-long learning. Keep abreast of medical literature and assess new knowledge and apply it to resolve patient problems
- Know one's limitations and ask for help as needed from colleagues, consultations or referrals
- Apply quality assurance procedures for improvement in daily work
- Be a role model for others.

Ethics
- Maintain patient autonomy by demonstrating shared-decision-making with the patient and/or family
- Obtain informed consent, maintain patient confidentiality and do no harm
- Provide cost-effective care while ordering investigations and in management and use resources appropriately.

Leadership
- Demonstrate accountability for their decisions and actions, and that of their team
- Demonstrate willingness to assume leadership role(s) when needed in given situations or events (rush call/code).
- Change and bring about change as necessary, as a leader or supportive leader.

7. Pedagogy

Should be able to demonstrate competence in teaching skills:
- Effective clinical/community-based teaching
- Some evidence of acquisition of theory regarding learning and education
- Practice some of the best teaching methods.

8. Advocacy

Advocacy is needed at multiple levels

- Advocacy for the Patient
  - Doctors and nurses are the advocates of the patients, otherwise patients are likely to be lost in the system. All care should be timely, putting patients first.

- Advocacy for the Practice
  - Working in a service or practice, doctors must highlight limitations and issues
  - They must identify solutions for the problems, and recommend and implement improvements for the practice(s) and institutional system(s).

- Advocacy for the Health System and Society
  - Know one's role in the Health System(s) and build strong referral systems
  - Keep patient and community interests paramount, above one's own personal or professional interest
  - Demonstrate advocacy for elimination of the social determinants of health
  - Demonstrate advocacy for prevention of serious illnesses of their specialty/sub-specialty.

- For the Profession
  - Strive for building trust in the public for your profession
  - Demonstrate improvement and enhancement of profession, specialty and sub-specialty
  - Be conscientious gate-keepers of their profession, specialty and subspecialty.

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GENERAL REGULATIONS

Following regulations apply to all candidates taking FCPS-I examinations. Candidate will be admitted to the examination in the name (surname and other names) as given in the MBBS/BDS degree. CPSP will not entertain any application for change of name on the basis of marriage / divorce / deed.

ELIGIBILITY

- MBBS or equivalent qualifications registered with the PMDC.
- One year house job in an institution recognized by the CPSP / PMDC, which should have been completed at least two months before the date of examination.
- Deficiency of house job could be compensated by an equal period of residency in an institution recognized by the CPSP.

EXEMPTION

Exemption from FCPS Part-I is regulated as mentioned in CPSP Notification No. Ref#CPSP/Sec/2020/70 dated: 26 February 2020.

AIM AND OBJECTIVES

AIM

The overall aim of FCPS Part-I examination is to select candidates who have acquired a solid foundation of basic science knowledge and the ability to apply it for resolving common clinical problems. The objectives of the two papers are instrumental for achieving this aim.

OBJECTIVES

Paper-I: To test application of core concepts of Basic Sciences to clinical problems common across all groups of specialties of CPSP.

Paper-II: To test application of basic science knowledge to clinical problems related to each specific specialty.

SYLLABUS

Candidates for the Fellowship of the College are expected to have a sound working knowledge of the structure and functions of the human body and the various mechanisms whereby these structures & functions are altered leading to diseased states. The emphasis in the FCPS Part-I examinations is on comprehension of the various mechanisms by which the body works and adjusts to external and internal changes. Concepts of the integration and interrelationship of various parts of the body are to be given more importance than finer details of structure and function.

The outline of various topics given in this syllabus is a guide to what at the moment are considered to be important topics which the candidate is expected to know. This is to help both the candidate and the examiner in defining the minimum boundaries of FCPS Part-I examination.

PAPER-I

The syllabus given below is common for all specialties, but the emphasis should be on clinical problems that are important to know by all candidates seeking entry to any specialty.

ANATOMY

General Embryology:

- Early development
  - Congenital Gametogenesis
  - Fertilization
  - Implantation and Factors Affecting it
  - Process from Fertilized Ovum to Germ Layer Formation
  - Derivatives of the Germ Layers
  - Formation of the Neural Tube, Neural Crest Cells and their Derivatives
  - Twinning
  - Basic concepts of Congenital Abnormalities and their Prenatal Diagnosis
  - Chromosomal Abnormalities and their Consequences (Structural and Numerical)
- Normal and Defective Development of:
  - Musculoskeletal System
  - Urogenital System
  - Gastrointestinal Tract (GIT)
  - Cardiovascular System
  - Respiratory System
  - Central Nervous System (CNS)
  - Head and Neck
  - Special senses

General Histology

- Cells and Tissues Related in the Organization of the Body
- Microscopic Features of:
  - Epithelia and Cell Junctions
  - Connective Tissue including Bone and Cartilages
  - Muscular Tissue
  - Nervous Tissue

Special Histology

- Microscopic Features of the Organs Present in:
    - Gastrointestinal Tract (GIT)
    - Genitourinary System
    - Immune System
    - Endocrine System
    - Respiratory System
    - Integumentary System
    - Special senses

Gross Anatomy

- Normal Features and Anatomical Basis of Common Clinical Conditions in:
    - Upper Limb
    - Lower Limb
    - Thorax
        - Respiratory System
        - Cardio Vascular System (CVS)
    - Abdomen
        - Gastrointestinal Tract (GIT)
        - Biliary System
        - Abdominal Wall
        - Peritoneum
    - Pelvis (Male and Female Genitourinary Organs)
    - Head and Neck

Neuroanatomy

- Structures and Functions of the Parts of Nervous System and Neurological Problems Arising from their Derangement:
    - Spinal Cord
    - Forebrain
    - Midbrain
    - Hindbrain
    - Ventricular System
    - Blood Supply of Brain

PHYSIOLOGY

Cell, Nerve and Muscle

- Cell Functions and Signaling
- Transport across Cell Membrane and Homeostasis
- Nerve Transmission, Skeletal and Smooth Muscle Contraction
- Neuromuscular Transmission

Blood and Immunity

- Blood Cell and Plasma Functions
- Immunity and Allergy
- Hemostasis
- Blood Groups

Cardiovascular System

- Cardiac Excitation
- Cardiac Cycle
- ECG (Applied)
- Blood Pressure Regulation
- Microcirculation
- Circulatory Shock
- Cardiac Failure

Respiratory System

- Pulmonary Ventilation and Perfusion
- Gaseous Exchange
- Transport of Gases
- Regulation of Respiration

Gastrointestinal Tract (GIT) and Liver

- GIT Motility
- Secretions
- Hormones
- Regulation
- Gastrointestinal Disorders
- Hepato-biliary Functions

Renal and Body Fluids

- Regulation of Body Fluids and Electrolytes
- Functions of Kidneys
- Regulation of Urine Osmolarity
- Blood Pressure
- Acid Base Balance

CNS
- Organization of CNS
- Sensory System
- Motor System
- Higher Mental Functions
- Autonomic Nervous System (ANS)
- Neurotransmitters

Special Senses
- Vision
- Hearing and Body Balance
- Olfaction
- Gustation

Endocrinology
- Hormones of:
    - Hypothalamus
    - Pituitary
    - Thyroid
    - Parathyroid
    - Pancreas
    - Adrenal Glands

Reproduction
- Male Reproductive System
- Female Reproductive System (Reproductive Cycle, Fertilization, Pregnancy, Parturition, Lactation)
- Neonatal Physiology

Exercise and Unusual Environment
- Sports Physiology
- High Altitude Physiology
- Deep Sea Physiology
- Disaster Physiology

BIOCHEMISTRY

Structure, Functions and Metabolism of Biomolecules
- Carbohydrates
- Proteins
- Lipids
- Nucleic Acids

Control, Regulation and Disorders of Metabolism

- Enzymatic Control of Metabolism
- Hormonal Regulation of Metabolism
- Clinical Uses of Enzymes, Co-Enzymes, Minerals & Hormones
- Digestive and Metabolic Disorders
- Congenital and Acquired Metabolic Disorders
- Disorders of Enzymes, Co-Enzymes, Minerals and Hormones

Biomedical Diagnostic Techniques and their Application

- Photometry
- Enzyme-linked Immuno-sorbent Assay (ELISA)/ Radio-immuno Assay (RIA)
- Electrophoresis
- Chromatography
- Techniques in Molecular Genetics
- Recombinant DNA and Genomic Technology
- Estimation of Proteins, Lipids, Carbohydrates, Nucleic acids
- Polymerase Chain Reaction (PCR)
- Cloning
- Blotting Techniques
- DNA and RNA Sequencing
- Microarray Techniques

PHARMACOLOGY

Pharmacology syllabus comprises of basic concepts in pharmacokinetics, pharmacodynamics and their clinical application. Systemic pharmacology includes classification of drugs, mechanism of action at molecular level, indications, contraindications and side-effects.

General Pharmacology

- Movement of Drug Molecules across Cell Membrane
  - Ion Trapping
- Metabolism
  - Phase I and II Reactions, Role of Cytochrome p450 Enzymes.
  - Genomics – Fast & Slow Metabolizers, Enzyme Inducers and Inhibitors.
  - Adverse Drug Reactions, Drug-Drug Interactions
- Plasma Protein Binding and Bioavailability
- Clearance

- Half-Life, Steady State Concentration, Loading and Maintenance Dose
- Receptor Types
  - Receptor-Receptor Interaction
  - Efficacy, Potency

Autonomic Nervous System (ANS) and Central Nervous System (CNS)

- Autonomic Nervous System (ANS)
  - Sympathetic and Parasympathetic (Mimetic and Lytic) Drugs
  - Organophosphate Poisoning
- General /Local Anaesthesia
- Anti-depressants, Mood Stabilizers, Anxiolytics, Anti-psychotics, Anti-convulsants, Drugs used in Parkinson's Disorder, Alzheimer's and Dementia
- Analgesics
  - Opioids and Drug Abuse
  - Non-steroidal Anti-inflammatory Drugs (NSAIDs)
  - Disease-modifying Anti-rheumatic Drugs (DMARDs)'s and Anti-Gout Drugs
  - Spasmolytics

Cardiovascular System (CVS) and Blood

- Cardiovascular System (CVS)
  - Anti-hypertensives
  - Anti-arrhythmics
  - Anti-anginal Drugs
  - Drugs used in Dyslipidemia and Cardiac Failure
- Blood
  - Anti-platelet Drugs
  - Anti-coagulant Drugs

Gastro-Intestinal Tract (GIT) and Hepato-Biliary System

- Drugs used in Acid Peptic Disease, Inflammatory Bowel Diseases, Irritable Bowel Syndrome and Intestinal Motility Disorders
- Anti-protozoal and Anti-helminthic Drugs

Respiratory System

- Drugs used in Treatment of Asthma and Chronic Obstructive Pulmonary Disease (COPD)

Endocrine System

- Anti-diabetic Drugs
- Anti-thyroid Drugs
- Adreno-corticoids and Adreno-cortical Antagonists
- Drugs that affect Bone Mineral Homeostasis

Chemotherapeutic Agents

- Anti-microbials
- Anti-tubercular Drugs
- Immunosuppressive Drugs
- Anti-viral Drugs
- Anti-fungal Drugs
- Anti-neoplastic Drugs
- Targeted and Non-targeted Therapy

GENERAL PATHOLOGY

- Effects of Injury on Cell by Physical, Chemical and Biological Agents
- Inflammation
  - Acute
  - Chronic including Granulomatous
- Regeneration and Repair
- Metabolic Response to Trauma
- Disturbance of Homeostatic Mechanism
  - Haemorrhage and Shock - Mechanism and Types
  - Oedema
  - Disturbance of Fluids and Electrolytes
- Thrombosis and Embolism, Infarction and Gangrene
- Disorders of Growth - Atrophy, Hypertrophy, Hyperplasia
- Carcinogens and Pre-Malignant Lesions
- Neoplasia: Types and Spread of Tumor
- General Characteristics of Bacteria, Viruses, Parasites and Fungi
- Immune System: General Principles
- Medical Genetics - Basic Concepts
- Interpretation of Routine Biochemical Tests such as Liver Function Tests, Glucose, Urea, Creatinine
- Nutritional Diseases, Disorders due to Deficiency of Vitamins and Minerals
- Cancer Epidemiology

RESEARCH AND BIOSTATISTICS BASIC CONCEPTS

- An Introduction to Epidemiology and its Role in Understanding Distribution and Determinants of Epidemiology of Disease
- Measures of Disease Occurrence
- Study Designs, their Advantages and Disadvantages
- Measures of Association
- Chances, Bias and Confounding
- Screening

Biostatistics

- Introduction to Biostatistics
- Data and its Kinds
- Summarization of Data
- Measures of Central Tendency and Dispersion
- Normal Distribution
- Point and Interval Estimation and Probability
- Hypothesis Testing, Significance Level and Power
- Sampling and its Techniques

BEHAVIOURAL SCIENCE & MEDICAL ETHICS-GENERAL PRINCIPLES

- Medical Ethics
- Communication Skills including Doctor-Patient Relationship and Counseling
- Psycho-social Aspects of General Health Care

PAPER-II

GENERAL PATHOLOGY

Environmental factors for causation of diseases

Gene Defects

- Single gene and polygenic defects
- Transmission pattern
- Cytogenetic disorders

Neoplasia - Etiology, Risk Factors and Carcinogenic Agents

- Tumour immunity
- Grading and staging of malignant tumour
- Laboratory diagnosis of cancer

General Aspects of Infectious Diseases

Disorders of Pigment Metabolism

HISTOPATHOLOGY

Gene Defects

- Cytogenetic disorder
- Common syndromes, its mutations and associated diseases
- Role of tumour suppressor genes and proto-oncogenes

Neoplasia

- Grading and staging of tumor
- Laboratory diagnosis of cancer

Histological Aspects of Common Infectious Diseases

- Tuberculosis
- Typhoid
- Amoebiasis

Histology

- Gastrointestinal system, liver, biliary tract and pancreas
- Heart and blood vessels
- Respiratory Tract
- Female and male genital tract
- Kidney, ureter, and urinary bladder
- Breast
- Endocrine System

- Skin and Skeletal System
- Nervous System

Cardiovascular Disease
- Pathogenesis and morphology of myocardial infarction
- Features of congenital heart disease
- Types of vasculitis
- Pathogenesis and aetiology of atherosclerosis
- Common vascular tumors

Renal Diseases
- Pathogenesis and aetiology of nephrotic syndrome
- Types of glomerulonephritis
- Diabetic and hypertensive nephropathy

Endocrine: Benign Disorders / Tumors
- Diseases of pituitary glands
- Diseases of thyroid glands
- Diseases of parathyroid glands
- Diseases of adrenal glands

Respiratory Tract & Mediastinum
- Aetiology of lung cancer
- Common lung tumours
- Aetiology of interstitial lung diseases
- Respiratory tract infections
- Thymic tumors

GIT, Liver & Pancreatic Biliary Tract
- Aetiology of inflammatory diseases of esophagus, stomach, and colon
- Aetiology and pathogenesis of malabsorption conditions
- Polyps of GIT
- Common GIT malignancies
- Common Disorders of Liver including Gall bladder & Pancreas
- Common Malignant Tumors of Liver, Gall bladder & Pancreas

Breast
- Common benign disorders of breast
- General aspects of breast cancer

Female Genital Tract
- Abnormalities of Endometrium
- Common Tumours of Ovary and Uterus
- Common Trophoblastic Tumours

Male Genital Tract
- Common Testicular Tumours
- Common Disorders of Prostate

Urinary Tract
- Common Kidney Glomerulopathies
- Etiology of Bladder Cancer
- Common Kidney Tumours

Nervous System
- Common Tumours of Brain / Spinal cord
    - Glioblastoma and Meningioma

Head and Neck Tumors
- Squamous Cell Carcinoma and its common etiologies
- Common Salivary Gland Tumors

Bone Diseases, Bone and Soft Tissue Tumours
- Osteomyelitis
- Osteochondroma
- Osteosarcoma and Chondrosarcoma
- Common Benign & Malignant Soft tissue Tumours

CHEMICAL PATHOLOGY

Water and Electrolyte Disorders
- Potassium Disorders
- Sodium Disorders
- Disorders of ADH

Acid-based Disorders
- Basic Brush-up e.g. Bicarbonate Buffer System, Anion gap, Compensation
- Single Disorders
- Double Disorders
- Decoding Blood Gases Results

Renal Dysfunction
- Glomerular Function Tests
- Tubular Function Tests
- Acute Kidney Injury
- Chronic Kidney Disease

Carbohydrate Disorders
- Diabetes Mellitus
  - Definition
  - Classification
  - Pathogenesis
  - Diagnostic Criteria
  - Complications
  - Gestational Diabetes Mellitus
- Pre-Diabetes
- Hypoglycaemia

Lipid Disorders
- Lipid metabolism
- Familial Hypercholesterolaemia
- Familial Combined Hyperlipidaemia
- Hypertriglyceridaemia
- Lipid Testing

Disorders of Plasma Proteins
- Amino Acids
- Protein Synthesis
- Acute Phase Reactants
- Plasma Protein Testing

Liver Functional Disorders
- Acute and Chronic Hepatitits
- Hyperbiilirubinaemias
- Liver Cirrhosis
- Non-Alcoholic Fatty Liver Disease
- Liver Function Tests

Disorders of Iron Metabolism
- Iron Metabolism
- Tests of Iron Deficiency
- Diagnosis of Haemachomatosis

Disorders of Calcium, Vitamin D and Parathyroid Hormones

- Hypercalcaemia
  - Hypercalcaemia of Malignancy
  - Primary Hyperparathyroidism
- Hypocalcaemia
  - Vitamin D Deficiency
  - Secondary Hyperparathyroidism
  - Hypoparathyroidism

Cardiac Biomarkers

- Definition of Myocardial Infarction
- Troponins
- BNP
- Myoglobin

Disorders of Uric Acid Metabolism

- Hyperuricaemia
- Gout

Disorders of Thyroid Function

- Hypothyroidism (Overt and Sub-Clinical)
- Hyperthyroidism (Overt and Sub-Clinical)
- Non-thyroidal Illness syndrome
- Gestational Hyperthyroidism

Adrenal Disorders

- Hypercortisolism
  - Cushing Syndrome
  - Cushing Disease
- Hypoadrenalism
  - Addison Disease
  - Secondary Hypocortisolism
- Pheochromocytoma
- Congenital Adrenal Hyperplasia

Disorders of Reproductive Endocrinology

- Polycystic Ovarian Syndrome
- Primary Ovarian Insufficiency
- Male Infirtitlity

Disorders of Sexual Development
- Congenital Adrenal Disorders
- Androgen Insensitivity Syndrome

HAEMATOLOGY

Normal Hemopoiesis
- Site of hemopoiesis
- Concept of Stem cell
- Stages of hemopoiesis
- Role of growth factors
- Hemoglobin synthesis

Disorders of RBCs
- Hypochromic microcytic
  - Types
    - Iron deficiency anemia
    - Sideroblastic anemia
  - Iron metabolism
    - Absorbtion/regulation/evaluation
- Macrocytic anemias
  - Metabolism-Vit B12 and Folate
    - Types
      - Non-megaloblastic and megaloblastic anemia
      - Vit B12 and folate deficiency
- Hemolytic anemias
  - Pathogenesis of hemolysis
  - Intravascular /extravascular hemolysis
  - Classification of hemolytic anemias
  - Inherited hemolytic anemias
    - G6PD deficiency
    - Hereditary spherocytosis
    - Thalassemia
  - Acquired hemolytic anemias
- Causes of pancytopenia

Aplastic Anemia
- Inherited
- Acquired

Disorders of WBCs

- Benign disorders
  - Leucopenias
  - Leucocytosis
  - Leukemoid reaction
  - Leucoerythroblastic picture
- Malignant disorders
  - Acute leukemias
    - Myeloid leukemias
    - Lymphoid leukemia
  - Chronic leukemias
    - Chronic Myeloid leukemia
    - Chronic lymphocytic leukemia
  - Multiple myeloma
- Myeloproliferative disorders
  - Polycythemia Vera
  - Essential Thrombocythemia

Disorders of Hemostasis

- Components of hemostasis
- Pathways of coagulation
- Coagulation disorders
  - Inherited
    - Hemophilia/ Von Willibrand disease
  - Acquired
    - DIC
- Platelet disorders
  - Thrombocytopenia
  - Platelet function disorders
- Thrombophilia
  - Inherited
  - Acquired

Blood Transfusion

- ABO and Rh Blood groups
- Cross match
- Donor selection
- Indications of transfusion
- Complications of blood transfusion
- Hemolytic disease of newborn

Stem Cell Transplant
- Indications
- Types
- Complications

Hematological Manifestations of Systemic Diseases/Drugs
- Infections
  - Malaria, Leishmania, TB, Hepatitis and Covid-19
- Autoimmune diseases
  - SLE and Rheumatoid arthritis
- Renal failure
- Drugs

MICROBIOLOGY

General Microbiology
- Relate basic structure, morphology, growth and physiology of microorganisms with their:
  - Staining and biochemical properties
  - Classification & identification
  - Normal habitat and existence as normal flora
  - Growth on different culture media and environmental conditions

Principles of Sterilization and Disinfection
- Chemical methods
- Thermal methods
- Radiation

Principles of Various Preventive Measures
- Vaccination
- Chemoprophylaxis
- Isolation precautions
- Laboratory biosafety (Basic principles)

Antimicrobial Agents
- Classify major groups of antimicrobial agents with their:
  - Site of action
  - Bioavailability
  - Mode of administration
  - Common side effects

Systemic Microbiology

- Describe common agents of community acquired infections according to age groups
- Relate pathogenesis (habitat, acquisition, virulence factors, risk factors) of common community acquired infections and opportunistic infections with their causative organisms
- Clinical presentations, laboratory diagnostic features and preventive measures
- Interpret CSF DR findings to differentiate between various etiologies of meningitis/encephalitis
- Correlate Urine DR findings with urine culture (pus cells/ red cells/cast/ leukocyte esterase)
- Differentiate between inflammatory and non-inflammatory diarrhea on the basis of stool DR findings
- Differentiate between:
    - Gram-positive and Gram-negative bacteria
    - Acid fast and non-acid fast organisms
    - Lactose fermenters and non-lactose fermenters
    - Various types of hemolysis on blood agar
    - Common enteric bacteria on selective stool media

Methods of Identification and Isolation of Microbial Agents (Culture and Non-Culture Based)

- Gram-positive organisms
- Gram-negative organisms
- Mycobacteria (Tuberculosis, Leprosy, Non-tuberculous)
- Fungi: Candida, Aspergillus, Cryptococcus, Mucor, Pneumocystis, Dermatophyte
- Hemoparasites: Malaria, Filaria
- Intestinal parasites
- Unicellular - Giardia, Entamoeba
- Multicellular - Nematodes, Cestodes

IMMUNOLOGY

Immunity

- **Innate Immunity: components and features**
    - Properties of Innate Immunity
    - Recognition of Microbes by Innate Immunity
    - Effector Mechanisms of Innate Immunity

- **Adaptive Immunity: components and features**
  - Antibody-Mediated Immunity
    - The Primary Response
    - The Secondary Response
    - Tests for/of Humoral Immunity
  - Cell-Mediated Immunity
    - Tests for/of Cell-Mediated Immunity
      - Skin test for DTH
      - Enumeration of lymphocyte subsets
  - Features of Active and Passive Immunity

- **Antigens**
- **Cellular Basis of the Immune Response**
  - Origin and Development of Immune Cells
    - T Cells
    - B Cells
    - Natural Killer Cells
    - Macrophages

- **T Cells**
  - CD4 & CD8 Types of T Cells
  - Activation of T Cells
  - Costimulation to Activate T Cells
  - T Cells Recognize Only Peptides
  - Memory T Cells
  - T Cell Receptor
  - Effect of Super antigens on T Cells
  - Features of T Cells
  - Effector Functions of T Cells
  - Regulatory Functions of T Cells

- **B Cells**
  - Origin and Clonal Selection
  - Activation of B Cells
  - Effector Functions of B Cells/Plasma Cells

- **Antigen-Presenting Cells**
  - Macrophages
  - Dendritic Cells
  - B Cells

- **Comparison of T Cells and B Cells**
- **Follicular Dendritic Cells**
- **Natural Killer Cells**
- **Neutrophils**
- **Eosinophils**
- **Basophils & Mast Cells**

Antibodies
- **Introduction of Immunoglobulins**
- **Structure of Immunoglobulins**
- **Isotypes/Classes of immunoglobulins**
  - Properties of Immunoglobulins
- **Isotypes, Allotypes, & Idiotypes**

Major Histocompatibility Complex & Transplantation
- **Introduction**
- **MHC Proteins**
  - MHC Class-I
  - MHC Class-II
- **Biologic Importance of MHC**
- **Transplantation and Allograft Rejection**

Complement
- **Introduction**
- **Activation of Complement**
- **Regulation of the Complement System**
- **Biologic Effects of Complement**
  - Opsonization
  - Chemotaxis
  - Anaphylatoxin
  - Cytolysis
  - Enhancement of Antibody Production
- **Clinical Aspects of Complement**

Hypersensitivity (Allergy)
- **Introduction**
- **Type-I: Immediate (Anaphylactic) Hypersensitivity**
  - Atopy
  - Drug Hypersensitivity
  - Desensitization Treatment & Prevention
- **Type-II: Cytotoxic Hypersensitivity**

- **Type-III: Immune Complex Hypersensitivity**
  - Arthus Reaction
  - Serum Sickness
  - Immune Complex Diseases
- **Type-IV: Delayed (Cell-Mediated) Hypersensitivity**
  - Clinically Important Delayed Hypersensitivity Reactions

Tolerance & Autoimmune Disease

- **Tolerance**
  - T Cell Tolerance
  - B Cell Tolerance
- **Induction of Tolerance**
- **Etiology of Autoimmune Diseases**
  - Genetic Factors
  - Hormonal Factors
  - Environmental Factors
- **Mechanisms of Autoimmunity**
  - Molecular Mimicry
  - Alteration of Normal Proteins
  - Release of Sequestered Antigens
  - Epitope Spreading
  - Failure of Regulatory T Cells
- **Autoimmune Diseases**
  - SLE
  - Rheumatoid Arthritis
  - Vasculitis

Immunodeficiency

Common Immunodeficiencies

- **B-Cell Deficiencies**
  - X-Linked Hypogammaglobulinemia
  - Selective IgA deficiency
  - CVID
- **T-Cell Deficiencies**
  - Thymic aplasia (DiGeorge's)
  - Chronic mucocutaneous candidiasis
  - Hyper IgM syndrome
- **Combined B-Cell & T-Cell Deficiencies**
  - SCID
  - Wiskott-Aldrich Syndrome
  - Ataxia–Telangiectasia

- **Complement Deficiencies**
  - Hereditary angioedema
- **Phagocyte Deficiencies**
  - CGD
  - Hyper IgE syndrome
  - LAD

Tumor Immunity
- **Tumor-Associated Antigens**
- **Mechanism of Tumor Immunity**
- **Cancer Immunotherapy**

Immunotherapeutic Agents

Serum Proteins, Para Proteins and Related Diseases

Immunophenotyping In Diagnosis of Lymphoproliferative Disorders

VIROLOGY
General Virology
Basic Virology
- Structure and size of viruses
- Replication of viruses
- Host defenses against viruses

Classification of Viruses
- Classify DNA viruses with examples
- Classify RNA viruses with examples

Atypical Virus Like Agents
- Defective viruses
- Viroids
- Prions
- Pseudovirions
- Prions

Antiviral Agents
- Site of action
- Stages of viral replication inhibited by antiviral drugs
- Mode of administration
- Mechanism of action

- Indications
- Common side effects

Special and Clinical Virology

Hepatitis A Virus
- Epidemiology, Pathogenesis, Mode of transmission and Incubation period
- Laboratory diagnosis

Hepatitis E Virus
- Epidemiology, Pathogenesis, Mode of transmission and Incubation period
- Laboratory diagnosis

Hepatitis B and Hepatitis C Virus:
- Epidemiology, Pathogenesis, Mode of transmission and Incubation period
- Laboratory diagnosis
- Complications

Dengue Virus
- Clinical features
- Transmission of dengue virus, laboratory diagnosis and complications of dengue infection

Dosage and Administration of Viral Vaccines
- Hepatitis B virus vaccine
- Measles, Mumps and Rubella (MMR)
- Polio virus vaccine
- Influenza virus vaccine

Human Immunodeficiency Virus
- Epidemiology, Pathogenesis and Mode of transmission
- Laboratory diagnosis

SARS-CoV-2
- Transmission, Sample collection
- Diagnosis

Influenza Virus
- Transmission, Pathogenesis
- Laboratory diagnosis

EXAMINATION SCHEDULE

The FCPS Part-I examinations will be held four times a year as per schedule notified on CPSP website.

- The computer-based examination is held at headquarter and specified regional centres. At present, the centres are Karachi, Quetta, Hyderabad, Larkana, Bahawalpur, Multan, Lahore, Faisalabad, Islamabad, Peshawar, Abbottabad and Gilgit. Overseas Centres are Riyadh in Saudia Arabia, Kathmandu in Nepal and Birmingham in UK.
- Medium of examinations will be English.
- Any change in the dates and format of the examinations will be notified by the College before the examinations.
- Every successful candidate in FCPS Part-I examinations will be issued a letter to enable him/her to seek placement for training in a recognized training institute after which he/she will have to register with R&RC.
- The competent authority of the College has the power to debar any candidate from any examination if it is satisfied that such a candidate is not a fit person to take the College examinations because of using unfair means/ misconduct or other disciplinary reasons.

EXAMINATION FEES

- Applications along with the prescribed examination fee and required documents should be submitted latest by the last date notified for this purpose before each examination.
- The details of examination fee and fees for change of centre, subject, etc. shall be notified before each examination.
- Fees deposited for a particular examination, shall not be carried over to the next examination in case of withdrawal / absence/ exclusion.

PAYMENT OF EXAMINATION FEE

For appearing in examination in Pakistan:

- Fee may be deposited in any branch of Meezan Bank, throughout Pakistan, in favour of 'College of Physicians and Surgeons Pakistan Karachi'.
- Fee may also be paid online by using debit/credit card.

For appearing in examination in Kathmandu, Riyadh & Birmingham, the fee may be deposited as indicated in the examination form and its annexed notification.

REFUND OF FEES

On a written request for not appearing in the examination, submitted up to the last date of withdrawal of application, the refund is admissible to the extent of 75% of fees only. No request for refund will be accepted after the last date of withdrawal of the application. In case the application of a candidate is rejected by the CPSP, 75% of the examination fee will be refunded, after deducting 25% as processing charges. No refund will be made, for fees paid for any other reason, e.g. late fee, change of centre/ subject fee, etc.

FORMAT OF EXAMINATION

The examinations shall consist of two theory papers (Paper-I and Paper-II), consisting of 100 MCQs (One Best Type) each.

PAPER-I: will contain questions from the core knowledge of the following subjects:

- Anatomy
- Physiology and Biochemistry
- Pathology and Microbiology
- Pharmacology
- Research and Biostatics
- Behavioural Sciences and Medical Ethics

PAPER II: will contain questions from specialty related Basic Medical Sciences.

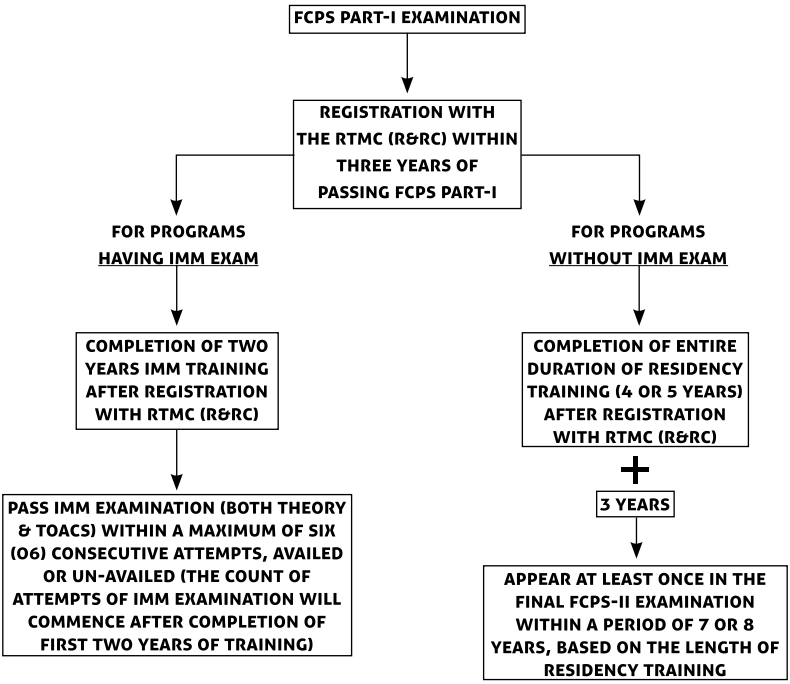
Validity of FCPS-I

- A candidate who successfully qualifies FCPS Part-I examination is required to register as FCPS resident within three years of passing FCPS Part-I.
- The validity of FCPS Part-I Exam shall vary with the presence or absence of Intermediate Module (IMM) in the specialty:

  Specialty programs with Intermediate Module (IMM):
  Following registration with the RTMC (R&RC), the resident must pass Intermediate Module (IMM) examination (both Theory & TOACS) within six (06) consecutive attempts, availed or un-availed, from the date of completion of two years in training.

  Specialty programs without Intermediate Module (IMM):
  Following registration with the RTMC (R&RC), the resident must appear at least once in the final FCPS-II examination within a period of 7 or 8 years depending upon the length of their residency training (4 or 5 years) plus 3 years.

Note:
Failure to comply with the above mentioned policies will result in the pass status of FCPS Part-I to become null and void. The candidate will therefore be required to re-appear and pass FCPS Part-l examination to keep the residency status alive and to make further attempts in IMM or FCPS-II examination.



Note:
Failure to comply with the above mentioned policies will result in the pass status of FCPS Part-I to become null and void. The candidate will therefore be required to re-appear and pass FCPS Part-I examination to keep the residency status alive and to make further attempts in IMM or FCPS-II examination.

THE COLLEGE RESERVES THE RIGHT TO ALTER/AMEND ANY RULES/ REGULATIONS
Any decision taken by the College on the interpretation of these regulations will be binding on the applicant.

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