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NOTIFICATION

No. A. 42011/1/2018-HFW, the 7th April, 2022. In the interest of public service, the competent authority is pleased to notify Syllabus for Direct Recruitment to the post of Grade-II of MHS (Specialist-Sub-Cadre) as per Appendix.

R. Lalramnghaka,
Secretary to the Government of Mizoram,
Health & Family Welfare Department.

APPENDIX

SYLLABUS FOR GRADE II OF MHS (SPECIALIST SUB-CADRE) UNDER HEALTH & FAMILY WELFARE DEPARTMENT

PAPER – I

Total marks - 200
Duration - 3 hours

- (a) Current events of national and international importance.
- (b) Indian Polity and Indian Constitution.
- (c) General issues on Environmental Ecology, Bio-diversity and Climate Change - that do not require subject specialization.
- (d) General awareness on Mizo culture, its heritage and society.
- (e) English Comprehension.
- (f) English Language (Class XII level).
- (g) Interpersonal skills including communication skills.
- (h) Logical reasoning and analytical ability.
- (i) Decision-making and problem-solving.

Note: Paper II, Paper III and Paper IV shall be classified as Technical Papers.

PERSONAL INTERVIEW:

The total marks allotted for personal interview for the post of Grade-II of Mizoram Health Service (Specialist sub-cadre) shall be as prescribed in "The Mizoram Direct Recruitment (Conduct of Examination) Guidelines, 2018 as amended issued vide No. A.12026/1/2017-P&AR (GSW) dt. 09.02.2018 or as prescribed by the Government from time to time.

I. BIO CHEMISTRY DEPARTMENT

PAPER – II (TECHNICAL)

Total marks - 200
Duration - 3 hours

1. Introduction to medical biochemistry, role of biochemistry in health care, ethics and responsibilities and foundations of biochemistry.
2. Biological cell, physical chemistry, fluid and electrolyte homeostasis and hydrogen ion homeostasis.
3. Bio molecules.
 - Function and classification of carbohydrates, lipid, protein and amino acids.
 - Stereoisomerism and chemistry of monosaccharides, amino acids and fatty acids.
 - Structural organization and structure-function relationships of proteins. Hemoglobin and myoglobin, molecular mechanism of O₂ transport and storage. Molecular basis of sickle cell anaemia and thallemias
 - Molecular mechanism of muscle contraction.
 - Plasma proteins, their functions and clinical significance.
4. Molecular biology and human genetics.
 - Nucleotides and their derivatives, synthetic nucleotides.
 - Human genetics.
 - Molecular genetics and biotechnology.
 - Molecular basis of carcinogenesis.
5. Immunology.
 - Types and concept of immunity, antigen, antibodies, Ag-Ab reactions, compliment system.
 - Immunoglobulins - classification, functions, generation of antibody diversity (immunogenetics).
 - Immune response of the body, immune deficiency diseases, hyper sensitivity, Immunology of transplantation and malignancy.

PAPER – III (TECHNICAL)

Total marks - 200
Duration - 3 hours

1. Enzymes and coenzymes.
 - Biomedical importance, nomenclature, classification, general properties.
 - Coenzymes and cofactors.
 - Mechanism of action, kinetics of enzyme action, km value and its significance.
 - Inhibitors of enzymes, naturally occurring enzyme inhibitors and regulation of enzyme activity.
 - Enzymes in clinical medicine.
 - Isoenzymes and isoforms of enzymes, metalloenzymes and metal activated enzymes.
 - The use of enzymes as laboratory tools (for diagnostic and research applications).
2. Vitamins, free radicals and anti-oxidants.
 - Structure, sources, recommended dietary allowances (RDA), biochemical role, metabolism in the body and deficiency manifestations of water soluble and fat-soluble vitamins.

- Megavitamin therapy and hypervitaminosis.
 - Use of vitamins in therapy.
 - Free radicals and anti-oxidants.
3. Bioenergetics and biological oxidation.
- The role of ATP and other high-energy phosphates, biologic oxidation, the respiratory chain.
 - Oxidative phosphorylation - theories, inhibitors, uncouplers, mitochondrial diseases.
4. Metabolism
- Metabolism of carbohydrates, lipids and proteins, disorders associated with abnormalities in the metabolism.
 - Integration of metabolism and metabolism in specialized tissues.
 - Metabolism of nucleic acids – purines, pyrimidines, disorders associated with abnormalities in the metabolism, nucleotide analogues in chemotherapy.
 - Laboratory assessment of metabolic disorders.
5. Metabolism of minerals, and human nutrition.
- Sodium, potassium, calcium, phosphorus, magnesium, copper, zinc, iron, chromium, selenium, cobalt, manganese, other trace minerals, Inborn errors of mineral metabolism.
 - General nutritional requirements, energy requirements, macronutrients and their roles, biological value of proteins, specific dynamic actions, balanced diet, dietary fibre, food fads, disorders of nutrition (protein malnutrition and protein energy malnutrition), biochemical assessment of nutritional status, laboratory diagnosis of nutritional disorders.

PAPER – IV (TECHNICAL)

Total marks - 200

Duration - 3 hours

1. Introduction to clinical chemistry.
- Principles of laboratory analysis, safety measures and first aid and waste disposal.
 - Specimen collection and other pre-analytical variables, anticoagulants and preservatives.
 - Computer application in clinical chemistry.
2. Analytical techniques and instrumentation.
- Centrifugation and ultracentrifugation.
 - Radioactivity, properties of radionuclides and measurement of radioactivity.
 - Radio-immuno assay (RIA).
 - Spectrophotometry, flame emission photometry.
 - Atomic absorption spectrophotometry. Fluorometry.
 - Chemiluminescence and bioluminescence, turbidimetry.
 - ion selective electrodes.
 - Electrophoresis (zone) - paper, agar gel, PAGE, SDS PAGE, iso-electric focusing.
 - Chromatography - column, paper, TLC, GLC, HPLC, gel filtration, ion exchange.
 - Principles of immunochemistry.
 - Immunoelectrophoresis, blotting techniques, ELISA.
 - Automation in clinical chemistry.
3. Laboratory operations.
- Routine biochemistry investigations: Blood glucose estimation, RFT, LFT, Lipid profile, cardiac markers, bone markers, pancreatic markers, anemia profile, trace elements, urine CSF, fluid biochemistry.
 - Special investigation: Hormones, tumor markers, troponins, vitamins, antioxidants, special proteins like CRP, haptoglobin and ceruloplasmin.
4. Basic principles of biostatistics as applied to health sciences:
- Concepts of probability, mean, standard deviation, coefficient of variation, correlation coefficient and tests of significance.

- Z-Score and VIS in biochemistry.
 - Selecting an analytical method, evaluation of an analytical method and diagnostic test.
5. Quality management.
- Fundamentals of Total Quality Management and implementing TQM.
 - The total testing process.
 - Control of preanalytical variables and analytical variables.
 - Internal/ external quality assessment and proficiency testing programs.
 - Quality control charts: Levy-Jenning, Cusum charts and others.
 - Quality assurance in clinical laboratories, use of reference values.

II. ANAESTHESIOLOGY DEPARTMENT

PAPER – II (TECHNICAL)

Total marks - 200

Duration - 3 hours

1. Anatomy
 - Cranial Nerves
 - Respiratory tract including anatomy of larynx
 - Broncho pulmonary segments
 - Heart
 - Brachial plexus
 - Cerebral circulation
2. Physiology
 - Theories of mechanism and production of Anaesthesia
 - Respiratory, Cardiovascular, hepatobiliary, renal, endocrine and CNS physiology including cerebral blood flow and ICP
 - Neuro muscular junction physiology
 - PFTs-principles and applications
 - Shock-Pathophysiology, clinical diagnosis and management
3. Biochemistry
 - Relevant to perioperative fluid balance, blood and blood products acid-base balance, parenteral nutrition
4. Oxygen Therapy

PAPER – III (TECHNICAL)

Total marks - 200

Duration - 3 hours

1. Anaesthetic record and Medico legal aspect of Anaesthesia
2. General Principles of pre operative assessment and pre-medication
3. Resuscitation
 - Overdose/poisoning, polytrauma, CPR, management of unconscious patient
4. Pharmacology
 - General pharmacological principles, concept of pharmacodynamics and pharmacokinetics
 - Inhalational agents, IV Anaesthetics, premedication drugs, drugs for postoperative pain, neuromuscular blockers, drugs in ICU
 - Drugs use for different diseases
 - Drug interactions in Anesthesiology
 - Local anaesthetic drugs

5. Physics & Equipments
- Gas laws, vaporization, vaporizers
 - Anaesthesia machine
 - Breathing systems
 - Airway equipment-Mask, Laryngoscope, Endotracheal tube, Tracheostomy tube, LMA, Fiberoptic laryngoscope etc.

PAPER – IV (TECHNICAL)

Total marks - 200
Duration - 3 hours

1. Artificial ventilation
 - Ventilators, modes, care of patient on ventilator
2. Acute and chronic pain
 - Pathophysiology and management
3. Anaesthesia for special situations
 - Neonatal & Paediatric
 - Geriatric
 - Out Patient Anaesthesia
 - Obstetric, Orthopaedics, ENT, Eye, Emergency. Plastic, Dental, Radio Diagnostic/Therapeutic, MRI
 - Neurosurgery, Cardio thoracic Surgery, Vascular surgery, transplant surgery, burn surgery
4. Anaesthesia for patients with common and uncommon diseases
5. Difficult airway management

III. CARDIOLOGY DEPARTMENT

PAPER-II (TECHNICAL)

Total marks - 200
Duration - 3 hours

I. BASIC SCIENCES RELATED TO CARDIOLOGY

A. Cardiac Anatomy

- 1) Development of heart and blood vessels,
- 2) Foetal circulation and its changes in post natal life;
- 3) Coronary circulation
- 4) Venous drainage of heart
- 5) The heart and pericardium and its relation to neighbouring structures
- 6) Anatomy of cardiac chambers and valves
- 7) Arteries and veins; histology of heart and blood vessels.
- 8) Functional anatomy of the heart,
- 9) Orientation of the heart within the Thorax,
- 10) Methods used to study cardiac anatomy, correlative anatomy,
- 11) New developments and future challenges,
- 12) Quantum computing
- 13) Ultrastructure of the heart,
- 14) Cardiac Embryology and Histology.

B. Cardiac Physiology

Cardiac Physiology will cover all the physiological changes in the heart during its normal function with special reference to cardiac cycle; myocardial contractility; pressure changes in the cardiac chambers; cardiac output; factors controlling blood flow; regulation of cardiac function; cardiac

reflexes; coronary blood flow; exercise physiology; physiology of blood pressure regulation; normal influence on cardiovascular system; preload; after-load; assessment of ventricular function; regulation of cardiac contraction; action potentials; the cellular basis of cardiac contraction, Integration of the cardiovascular system the response to dynamic exercise, etc.

C. Cardiac Molecular Biology

- Principles of molecular biology including Gene Structure,
- Expression and regulation;
- Recombinant DNA Technology; PCR Techniques,
- Molecular basis for cellular growth,
- Molecular and cellular biology of the normal, hypertrophied and failing heart including cardiac growth and hypertrophy
- Molecular and Cellular biology of the blood vessels including endothelial cell vascular smooth muscle interactions, atherosclerosis etc,
- The Human Genome and its future implications for cardiology including bioethical implications and genetic counseling,
- Cardiovascular Tissue modification by genetic approaches including Gene Transfer etc, Molecular Development of the heart including anomalies.

D. Cardiac Biochemistry

All aspects of normal and abnormal patterns of cardiac biochemistry including cardiac enzymes; lipid profile, cardiac metabolism, electrolytes and their effect on cardiac function etc.

E. Cardiac Pharmacology

All the drugs used in the treatment of cardiac disorders inclusive of antianginal agents like

- Beta-blocking agents,
- Nitrates and calcium channel blockers,
- Antifailure agents like diuretics,
- Angiotensin-Converting Enzyme (ACE) Inhibitors,
- Angiotensin-II Receptor Blocking Drugs (ARBs) and aldosterone antagonism, Digitalis,
- Acute Inotropes and inotropic Dilators
- Antihypertensive Drugs,
- Antiarrhythmic Drugs,
- Antithrombotic agents like Platelet Inhibitors, Anticoagulants and Fibrinolytics, Lipid-Lowering and Atherosclerotic Drugs, choice of drugs, which drug for which disease?, Adverse Cardiovascular Drug Interactions and Complications.

F. Cardiac Pathology

- All pathological changes in various cardiac diseases with special reference to clinical correlation included.
- Special emphasis on pathological changes in the pulmonary vascular system in various cardiac disorders;
- Pathogenesis and pathology of rheumatic fever and rheumatic heart disease;
- cardiomyopathies
- Dilated hypertrophic and obliterative / restrictive; congenital heart disease-
- Cyanotic and acyanotic; atherosclerosis;
- Coronary artery disease;
- Cardiac involvement in other systemic diseases and storage disorders etc.

G. Cardiac Microbiology

The various microbiological aspects of cardiac diseases including rheumatic fever, infective endocarditis, myocarditis are included. Cardiac Molecular Biology has been included under a separate head.

- II. FUNDAMENTALS OF CARDIOVASCULAR DISEASE
 - 1) Global Burden of Cardiovascular Disease, Heart Disease in Varied Populations
 - 2) Economics and Cardiovascular Disease
 - 3) Clinical Decision-Making in Cardiology
 - 4) Measurement and Improvement of Quality of Cardiovascular Care
 - 5) The Principles of Drug Therapy.
- III. MOLECULAR BIOLOGY AND GENETICS
 - 1) Molecular Biology
 - 2) Genomics and Proteomics in Cardiovascular Disease
 - 3) Genetics and Cardiovascular Disease
 - 4) Genetics of Cardiac Arrhythmias
 - 5) Genetics of Myocardial Disease.
- IV. EVALUATION OF THE PATIENT
 - 1) The History and Physical Examination: An Evidence-Based Approach,
 - 2) Electrocardiography
 - 3) Exercise Stress Testing
 - 4) Echocardiography
 - 5) The Chest Radiograph in Cardiovascular Disease
 - 6) Nuclear Cardiology
 - 7) Cardiovascular Magnetic Resonance,
 - 8) Computed Tomography of the Heart
 - 9) Cardiac Catheterization, Coronary
 - 10) angiography Intravascular Ultrasound Imaging.

PAPER –III (TECHNICAL)

Total marks - 200
Duration - 3 hours

- I. Heart Failure
 - 1) Mechanisms of Cardiac Contraction and Relaxation
 - 2) Pathophysiology of Heart Failure
 - 3) Clinical assessment
 - 4) Acute and Chronic Heart Failure
 - 5) Systolic Heart Failure
 - 6) Heart Failure with Preserved Systolic Function
 - 7) Surgical management of Heart Failure
 - 8) Assisted Circulation in the treatment of Heart Failure
 - 9) Emerging therapies for Heart Failure,
 - 10) Care of Patients with End-Stage Heart Disease.
- II. Arrhythmias, Sudden Death, and Syncope
 - 1) Genesis of Cardiac Arrhythmias: Electrophysiological Considerations
 - 2) Diagnosis of Cardiac Arrhythmias
 - 3) Therapy for Cardiac Arrhythmias
 - 4) Cardiac Pacemakers and Cardioverter-Defibrillators
 - 5) Specific Arrhythmias: Diagnosis and Treatment
 - 6) Cardiac Arrest and Sudden Cardiac Death
 - 7) Hypotension and Syncope.
- III. Preventive Cardiology
 - 1) The Vascular Biology of Atherosclerosis
 - 2) Risk Factors for Atherothrombotic Disease
 - 3) Systemic Hypertension: Mechanisms and Diagnosis

- 4) Systemic Hypertension: Therapy
- 5) Lipoprotein Disorders and Cardiovascular Disease
- 6) The Metabolic Syndrome
- 7) Diabetes Mellitus and Atherosclerotic Vascular Disease
- 8) Nutrition and Cardiovascular Disease
- 9) Primary and Secondary Prevention of Coronary Heart Disease,
- 10) Comprehensive rehabilitation of Patients with Cardiovascular Disease
- 11) Complementary and Alternative Approaches to Management.

PAPER - IV (TECHNICAL)

Total marks - 200

Duration - 3 hours

- I. Atherosclerotic Cardiovascular Disease
 - 1) Coronary Blood Flow and Myocardial Ischemia
 - 2) Approach to the Patient with Chest Pain
 - 3) ST-Elevation Myocardial Infarction: Pathology, Pathophysiology, and Clinical Features
 - 4) ST-Elevation Myocardial Infarction: Management
 - 5) Primary Percutaneous Coronary Intervention in the Management of Acute MI
 - 6) Unstable Angina and Non-ST Elevation Myocardial Infarction
 - 7) Chronic Coronary Artery Disease
 - 8) Percutaneous Coronary and Vasculature Intervention
 - 9) Diseases of the Aorta
 - 10) Peripheral Arterial Diseases
 - 11) Prevention and Management of Stroke
 - 12) Endovascular Treatment of Noncoronary Obstructive Vascular Disease
- II. Diseases of the Heart, Pericardium, and Pulmonary Vasculature Bed
 - 1) Congenital Heart Disease
 - 2) Valvular Heart Disease
 - 3) Infective Endocarditis,
 - 4) The Dilated, Infiltrative and Restrictive Cardiomyopathies, Hypertrophic Cardiomyopathies
 - 5) Myocarditis
 - 6) Cardiovascular Abnormalities in HIV-Infected Individuals
 - 7) Toxins and the Heart
 - 8) Primary Tumors of the Heart
 - 9) Pericardial Diseases
 - 10) Traumatic Heart Disease
 - 11) Pulmonary Embolism
 - 12) Pulmonary Hypertension,
 - 13) Sleep Disorders and Cardiovascular Disease.
- II. Cardiovascular Disease in Special Populations
 - 1) Cardiovascular Disease in the Elderly
 - 2) Cardiovascular Disease in Women
 - 3) Pregnancy and Cardiovascular Disease
 - 4) Sports Cardiology
 - 5) Medical Management of the Patient Undergoing Cardiac Surgery
 - 6) Anesthesia and Noncardiac Surgery in Patients with Heart Disease.

- IV. Cardiovascular Disease and Disorders of Other Organs
 - 1) Endocrine Disorders and Cardiovascular Disease,
 - 2) Hemostasis, Thrombosis, Fibrinolysis and Cardiovascular Disease
 - 3) Rheumatic Fever
 - 4) Rheumatic Diseases and the Cardiovascular System
 - 5) The Patient with Cardiovascular Disease and Cancer
 - 6) Psychiatric Behavioral Aspects of Cardiovascular Disease
 - 7) Neurological Disorders and Cardiovascular Disease
 - 8) Interface between Renal Disease and Cardiovascular Illness
 - 9) Cardiovascular Manifestations of Autonomic Disorders.

- V. Interventional Cardiology
 - 1) Percutaneous Coronary Interventions,
 - 2) Coronary Angioplasty,
 - 3) Atherectomy, Atheroablation and Thrombectomy,
 - 4) Coronary Stenting
 - 5) Balloon Valvuloplasty,
 - 6) Peripheral Intervention
 - 7) Pediatric interventions,
 - 8) Intraaortic Balloon Counterpulsation and other Circulatory Assist Devices
 - 10) Interventional Electrophysiology
 - 11) Cardiac pacemakers
 - 12) Implantable devices for heart failure and for the treatment of cardiac arrhythmias.

- VI. Cardiac Instrumentation
 - 1) Principles of cardiac instrumentation,
 - 2) Pressure recording invasive and non invasive
 - 3) ECG Machines
 - 4) Cardiac Monitors,
 - 5) Defibrillators
 - 6) Cath-Lab Equipment,
 - 7) EP Lab Equipment,
 - 8) Gamma Camera,
 - 9) CT Scan, MRI Equipment, PET Scans,
 - 10) Echocardiography including Stress Echo, Colour Doppler and TEE,
 - 11) Pacemakers temporary and Permanent, ICDs,
 - 12) Triple Chamber Devices
 - 13) radiofrequency ablation equipment,
 - 14) programmed stimulators
 - 15) IABP, Holter and Signal Averaging and ABP machines,
 - 16) Treadmill equipments,
 - 17) Hemodynamic recorders
 - 18) Oximeters,
 - 19) Computers and image processing in Cardiology etc

- VII. Recent Advances In Cardiology, Cardiac Epidemiology, Preventive Cardiology Including Related Cardiac Surgery

IV. DERMATOLOGY DEPARTMENT

PAPER – II (TECHNICAL)

BASIC DERMATOLOGY

Total marks - 200
Duration - 3 hours

Anatomy, organization and functions of human skin

1. Molecular biology, inflammation
2. Clinical immunology, allergy and photo immunology
3. Pruritus, eczema, lichenification
4. Atopic dermatitis, contact dermatitis
5. Naevi and other developmental defects
6. Tumours of skin appendages
7. Disorders of cutaneous melanocytes
8. Disorders of skin colour
9. CONNECTIVE TISSUE DISORDERS

PAPER – III (TECHNICAL) : SKIN DISEASES

Total marks - 200
Duration - 3 hours

1. Virus infections
2. Bacterial infections
3. Mycobacterial infections
4. Aids and the skin
5. Leprosy
6. Treponematoses
7. Mycology
8. Parasitic diseases, diseases caused by arthropods and other noxious animals
9. Disorders of keratinization and psoriasis
10. Genetic blistering diseases and immunobullous diseases

PAPER – IV (TECHNICAL) :DISEASES AND THERAPY

Total marks - 200
Duration - 3 hours

1. Lichen planus and lichenoid disorders
2. Rosacea, perioral dermatitis and acne
3. Urticaria, histiocytosis, mastocytosis
4. Purpura and microvascular occlusion, vasculitides, diseases of veins and arteries
5. Metabolic and nutritional disorders
6. Systemic diseases and skin
7. Drug reactions, erythema multiforme, Stevens-Johnson syndrome and toxic epidermal necrolysis
8. Dermatologic surgery
9. Topical therapy
10. Systemic therapy

V. ENT DEPARTMENT

PAPER - II (TECHNICAL):

Total marks - 200
Duration - 3 hours

- a) Embryology : (i) Ear, Nose, Paranasal sinuses
(ii) Oral cavity, Tonsil, Pharynx & Larynx
- b) Surgical Anatomy : (i) Nose, Para-nasal sinuses

- (ii) Oral cavity, Pharynx, Larynx
 - (iii) Neck including neck spaces & lymphatic drainage of head and neck
 - (iv) Major salivary glands, Thyroid and parathyroid
 - (v) Embryological anomalies in head and neck
- c) Physiology : Nose, Paranasal sinuses, Ears, Nasopharynx, Tonsil, Pharynx, Mechanism of deglutition, Larynx, Thyroid, Para-thyroid and Mechanism of hearing

PAPER – III (TECHNICAL)

DISEASES (INCLUSIVE OF AETIOLOGY
SYMPTOMS, INVESTIGATION & MANAGEMENT)

Total marks – 200
Duration - 3 hours

I. EAR :

- (a) Embryological anomalies of ear
- (b) Malignant & Benign nose (living & non- living)
- (c) Otitis Externa, Myringitis
- (d) Acute & Chronic Suppurative Otitis Media,
- (e) Deafness & its type
- (f) Vertigo : Central & Peripheral
- (g) Facial Palsy
- (h) Pre-auricular Sinus
- (i) Foreign Bodies in Ear Canal

II. NOSE & PARANASAL SINUSES :

- (a) Foreign body in nose (living & non- living)
- (b) Epistaxis
- (c) Rhino-sinusitis
- (d) Septal spur, Deviated Nasal Septum

III. Fracture nasal bones & Triped fraction

IV. Allergic Rhinitis, Nasal Polyp Fess (indication & procedure)

V. Malignant diseases of nose & para nasal sinuses

VI. Trigeminal & Glossopharyngeal Neuralgia

VII. ORAL CAVITY :

- (a) Malignant diseases
- (b) Benign ulcers of Oral cavity

PAPER- IV (TECHNICAL) :

Total marks – 200
Duration - 3 hours

A. LARYNX :

- (i) Acute Chronic Laryngitis –Aetiology, Investigation & Management
- (ii) Laryngo – Tracheitis
- (iii) Benign Disease of larynx & stridor
- (iv) Malignant disease of larynx

- (v) Foreign bodies of larynx, Trachea & Bronchitis
- (vi) Tracheostomy : (a) Elective (b) emergency

B. PHARYNX

- (i) Nasopharyngeal Malignant Disease
- (ii) Adenoids & Tonsils
- (iii) Malignant disease of Oropharynx
- (iv) Pharyngitis
- (v) Malignant disease of Pharynx
- (vi) Foreign body of Oesophagus

C. HEAD & NECK

- (i) Ludwig's Angina
- (ii) Parapharyngeal abscess
- (iii) Retropharyngeal abscess
- (iv) Secondary neck nodes
- (v) Benign Embryological Neck Masses
- (vi) Penetrating injury of neck
- (vii) Neck dissection-Types

VI. FORENSIC MEDICINE DEPARTMENT

PAPER-II (TECHNICAL)

Total marks – 200
Duration - 3 hours

Anatomy of part and organs of the body which are important from the medico-legal aspect.

- (i) Surface and regional anatomy of head, neck, chest and abdomen.
- (ii) Gross anatomy and blood supply of heart, brain, lungs, spleen, liver and kidneys.
- (iii) Gross anatomy of male and female genitalia.
- (iv) Comparative anatomy of male and female skeleton.
- (v) Histological examination of various tissues.
- (vi) Development of fetus.

A. Physiology and Biochemistry : Mechanism of phenomena that are important in the Body from the medico-legal viewpoint.

- (i) Mechanism of fluid and electrolyte balance, thermoregulation in newborn and adults, endocrine functions.
- (ii) Physiology of sexual behavior.
- (iii) Physiological functioning of circulatory system, digestive system, respiratory system, haemopoietic system, central nervous system and reproductive system including pregnancy.

B. Pathology : Pathophysiology of vital processes and response mechanisms that Modulate tissue and organ reaction to all forms of injury and have a bearing on ante-mortem and postmortem appearance in medico-legal cases, assessment of the duration of injuries and correlate trauma and disease.

- (i) Pathology of inflammation and repair, immunity and hypersensitivity, Thrombosis and embolism, electric and ionizing radiation injuries, genetic factors in disease, deficiency disorders and malnutrition.
- (ii) Pathology of myocardial infarction, congenital heart diseases, tuberculosis of lungs, cirrhosis of liver, diseases of glomeruli and tubules and interstitial; tissues of Kidney, tumors, endocrine disorders, venereal diseases, spontaneous intracranial hemorrhages.

- (iii) Pathology of sudden death.
 - (iv) Local and systemic response to trauma and patho-physiology of shock.
 - (v) Pathology of common infections and infestations of medico-legal significance.
- C. Dentistry : Application of knowledge of dentistry for solution of medico-legal problems like, injuries, age determination and identification.
- D. Radiology : Application of knowledge of radiological procedures for solution of Medico-legal problems
- E. Fundamentals of Forensic Medicine :
- (i) General forensic principles of ballistics, serology, analytical toxicology and Photography.
 - (ii) Interpretation of the scene of crime.
 - (iii) Role of DNA profile and its application in medico-legal practice.
 - (iv) Examination of bloodstains for blood grouping, nuclear sexing, HLA typing, Seminal stains and hair for medico-legal purpose.
 - (v) Ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph.
- II. Medical Ethics and Law (Medical Jurisprudence)
- (i) History of Forensic Medicine.
 - (ii) Legal and medico-legal system in India.
 - (iii) Medical ethics and the law in relation to medical practice, declarations, oath, Etiquette, Medical Council of India, disciplinary control, rights and duties of a registered medical practitioner's professional misconduct, consent, confidentiality, medical negligence (including all related issues) and Consumer Protection Act.
 - (iv) Medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights, cloning, genetic engineering, human genome, citizen's charter and International codes of medical ethics.
 - (v) Ethics and law in relation to artificial insemination, abortion, antenatal sex, foetus, genetics and euthanasia.
 - (vi) Interpretation of ethics and law applicable to the human (clinical trials) and animal experimentation.
 - (vii) Ethics in relation to elderly, women and children.
 - (viii) Medical ethics and law in relation to nursing and other medical services/practices.
 - (ix) Understanding about bio-ethics.

PAPER – III (TECHNICAL)

Total marks – 200

Duration - 3 hours

- I. Clinical Forensic Medicine
- (i) Examination, assessment of legal implications and preparation of report or certificate in cases of physical assault, suspected drunkenness, sexual offences, consummation of marriage and disputed paternity.
 - (ii) Collect, preserve and dispatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported.
 - (iii) Examination of injured person, preparation of medico-legal report and initiate management.
 - (iv) Determination of the age and established identity of an individual for medico-legal purpose.
 - (v) Examination of a person and assessment of disability in industrial accidents and diseases.

- (vi) Examination and interpretation of findings for medico-legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, Impotence, AIDS and infectious disease.
- (vii) Normal and abnormal sexual behavior and its medico-legal implications.
- (viii) Examination and assessment of medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness.
- (ix) Examination of medico-legal problems related to clinical disciplines of medicine and allied subjects, Paediatrics, Surgery and allied subjects, ENT, Ophthalmology, Obstetrics and Gynecology, Dermatology and Anesthesiology.
- (x) Examination of medico-legal problems related to children, women and elderly.
- (xi) Identification of cases of torture and violation of human rights and issues thereto.

II. Forensic Pathology

- (i) Application of principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, foot prints, hairs, tattoos, poroscopy and superimposition techniques.
- (ii) Medico-legal postmortem examination and exhumation, collection, preservation and dispatch specimens or trace evidence to the appropriate authority.
- (iii) Diagnosis and description of pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, lightning, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.
- (iv) Patho-physiology of shock and neurogenic shock.
- (v) Patho-physiology of asphyxia, classification, medico-legal aspects and postmortem findings of different types of asphyxia deaths.
- (vi) Diagnosis and classification of death, identification of signs of death, postmortem changes, interpret autopsy findings, artifacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.
- (vii) Medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
- (viii) Postmortem findings in infant death and to differentiate amongst live birth, still birth and dead born.
- (ix) Postmortem examination in cases of death in custody, torture and violation of human rights.
- (x) Postmortem examination in cases of death due to alleged medical negligence as in operative and anesthetic deaths.

PAPER – IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

I. Toxicology

- (i) Law relating to poisons, drugs, cosmetics, narcotic drugs and a psychotropic substances.
- (ii) Examination and diagnosis of poisoning cases and application of principles of general management and organ system approach for the management of poisoning cases.
- (iii) Basic principles of pharmacokinetics and pharmacodynamics of poisonous substances.
- (iv) Toxic hazards of occupation, industry, environment and the principles of predictive toxicology.
- (v) Collection, preservation and dispatch materials for analysis, interpretational of laboratory findings and medico-legal formalities in a case of poisoning.
- (vi) Demonstration of methods of identification and analysis of common poisons.
- (vii) Sign, symptoms, diagnosis and management of common acute and chronic poisoning due to :
 - a) Corrosives

- b) Nonmetallic substances
- c) Insecticides and weed killers
- d) Metallic substances
- e) Vegetable and organic irritants
- f) Somniferous compounds
- g) Inebriant substances
- h) Deliriant substances
- i) Food contamination/adulteration
- j) Substances causing spinal and cardiac toxicity
- k) Substances causing asphyxia (Asphyxiants)
- l) Household toxins
- m) Toxic envenomation
- n) Biological and chemical warfare
- o) Environmental intoxicants
- p) Occupational intoxicants.

II. Forensic Psychiatry

- (i) Common terminologies of forensic importance in Psychiatry.
- (ii) Medico-legal aspects of Psychiatry and mental health.
- (iii) Medico-legal aspects of drug addiction.
- (iv) Role of Psychiatry in criminal investigation, punishment and trial.
Civil and criminal responsibilities of a mentally ill person.
- (v) Role of Psychology in criminal investigation, punishment and trial.

VII. MEDICINE DEPARTMENT

PAPER- II (TEHCNICAL)

Total marks – 200
Duration - 3 hours

Basic sciences

1. Basics of human anatomy as relevant to clinical practice in neuro-anatomy.
2. Common pathological changes in various organs associated with diseases and their correlation with clinical signs; understanding various pathogenic processes and possible therapeutic interventions possible at various levels to reverse or arrest the progress of diseases.
3. About various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help; important organisms associated with tropical diseases, their growth pattern/life-cycles, levels of therapeutic interventions possible in preventing and/or eradicating the organisms.
4. Pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases kidneys/liver etc. which may need alteration in metabolism/excretion of the drugs; rational use of available drugs.
5. Various poisons with specific reference to different geographical and clinical settings, diagnosis and management.
6. Research Methodology and Studies, epidemiology and basic Biostatistics.
7. Biochemical basis of various diseases including fluid and electrolyte disorders; Acid base disorders etc.
8. Recent advances in relevant basic science subjects.

Systemic Medicine

1. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bio-terrorism.

2. Aging and Geriatric Medicine:
 - Biology
 - Epidemiology
 - Neuro-psychiatric aspects of aging
3. Clinical Pharmacology:
 - Principles of drug therapy
4. Genetics:
 - Overview of the paradigm of genetic contribution to health and disease
 - Principles of Human Genetics
 - Single gene and chromosomal disorders
 - Gene therapy
5. Immunology:
 - Innate and adaptive immune systems
 - Mechanisms of immune mediated cell injury
 - Transplantation immunology
6. Hematologic diseases:
 - Haematopoiesis
 - Anaemias
 - Leucopenia and leucocytosis
 - Myelo-proliferative disorders
 - Disorders of haemostasis and haematopoietic stem cell transplantation
7. Oncology:
 - Epidemiology
 - Biology and genetics of cancer
 - Paraneoplastic syndromes and endocrine manifestations of tumours
 - Leukemias and lymphomas
 - Cancers of various organ systems and cancer chemotherapy
8. Critical care in medicine

PAPER –III (TECHNICAL)

Total marks – 200

Duration - 3 hours

Cardio-vascular diseases:

- Approach to the patient with possible cardio-vascular diseases
 - Heart failure
 - Arrhythmias
 - Hypertension
 - Coronary artery disease
 - Valvular heart disease
 - Infective endocarditis
 - Diseases of the myocardium and pericardium
 - Diseases of the aorta and peripheral vascular system
1. Respiratory system:
 - Approach to the patient with respiratory disease
 - Disorders of ventilation
 - Asthma
 - Chronic Obstructive Pulmonary Disease (COPD)
 - Pneumonia
 - Pulmonary embolism

- Cystic fibrosis
 - Obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum
 - Interstitial lung disease (ILD)
 - Carcinoma of lung
2. Nephrology:
- Approach to the patient with renal diseases
 - Acid- base disorders
 - Acute kidney injury
 - Chronic kidney disease
 - Tubulo-interstitial diseases
 - Nephrolithiasis
 - Diabetes and the kidney
 - Obstructive uropathy and treatment of irreversible renal failure
3. Gastro-intestinal diseases:
- Approach to the patient with gastrointestinal diseases
 - Gastrointestinal endoscopy
 - Motility disorders
 - Diseases of the oesophagus
 - Acid peptic disease
 - Functional gastrointestinal disorders
 - Diarrhea
 - Irritable bowel syndrome
 - Irritable bowel disease
 - Pancreatitis and diseases of the rectum and anus
4. Diseases of the liver and gall bladder:
- Approach to the patient with liver disease
 - Acute viral hepatitis
 - Chronic hepatitis
 - Alcoholic and non-alcoholic steatohepatitis
 - Cirrhosis and its sequelae
 - Hepatic failure and liver transplantation
 - Diseases of the gall bladder and bile ducts
 - Autoimmune hepatitis

PAPER- IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Metabolic diseases:
- Inborn errors of metabolism
 - Disorders of metabolism
2. Nutritional diseases:
- Enteral and parenteral nutrition
 - Obesity and eating disorders
3. Endocrine :
- Principles of endocrinology
 - Diseases of various endocrine organs including diabetes mellitus
4. Rheumatic diseases:
- Approach to the patient with rheumatic diseases
 - Osteoarthritis
 - Rheumatoid arthritis

- Spondyloarthropathies
 - Systemic lupus erythematosus (SLE)
 - Polymyalgia
 - Rheumatic fibromyalgia and amyloidosis
 - Crystallopathies
5. Infectious diseases:
- Nosocomial infections
 - Bacterial diseases – general considerations, diseases caused by gram – positive bacteria, diseases caused by gram - negative bacteria
 - o Miscellaneous bacterial infections
 - o Mycobacterial diseases
 - o Spirochetal diseases
 - o Rickettsia
 - o Mycoplasma and Chlamydia
 - o Viral diseases
 - o DNA viruses
 - o DNA and RNA respiratory viruses
 - o RNA viruses
 - Fungal infections, protozoal and helminthic infections.
6. Neurology :
- Approach to the patient with neurologic disease, headache, seizure disorders and epilepsy, coma, disorders of sleep, cerebrovascular diseases, Parkinson’s disease and other movement disorders, motor neuron disease, meningitis and encephalitis, peripheral neuropathies, muscle diseases, diseases of neuromuscular transmission and autonomic disorders and their management.
7. Dermatology:
- Infections of skin
 - Cutaneous manifestations of systemic diseases
 - Drug induced rashes

VIII. ONCOLOGY DEPARTMENT

PAPER – II (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Molecular Biology of Cancer
 - The cancer genome
 - Molecular methods in cancer
 - Microbiome and Cancer
2. Etiology and Epidemiology of Cancer
 - Tobacco
 - Oncogenic viruses & Inflammation
 - Chemical, Physical and Dietary factors
 - Obesity and Physical activity
 - Epidemiologic methods
 - Cancer Incidence and Mortality
3. Cancer Therapeutics
 - Precision medicine in oncology
 - Cancer Immunotherapy
 - Pharmacogenomics

- Pharmacokinetics and Pharmacodynamics of anti-cancer drugs
- Cytotoxic chemotherapeutics agents
- Hormonal agents, Monoclonal antibodies & Immunotherapy agents
- 4. Practice of Oncology
 - Tumour Biomarkers
 - Stem Cell Transplantation
 - Management of adverse effects of treatment
- 5. Palliative and Supportive Care
 - Management of cancer pain
 - Nutritional support
 - Psychological issues
 - Specialized care of terminally ill
 - Rehabilitation of cancer patients

PAPER – III (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Anatomy
 - Head & Neck
 - Gastro-Intestinal Tract
 - Breast
 - Genito-Urinary System
 - Prostate
2. Staging
 - TNM staging system
 - FIGO staging system
 - Staging systems of Leukemias, Lymphomas and Myeloma
3. Basics
 - Imaging Strategies for Oncologic Diagnosis
 - Pathological biopsy of tumors
 - Principles of Multidisciplinary Treatment
4. Surgery
 - Principles of surgical oncology
 - Surgery of primary tumors and lymph node basin
 - Surgical emergencies in cancer patients
 - Surgery in metastatic disease
 - Surgery for prophylaxis
5. Childhood Cancers

PAPER – IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

Radiation Physics

1. Radiobiology
2. Clinical Radiation Oncology
 - Solid tumour and its management
 - Hematological malignancy and its management
 - Oncological emergencies
 - Palliative radiotherapy
3. Recent advances in Radiation Oncology

IX. OPHTHALMOLOGY DEPARTMENT

PAPER – II (TEHCNICAL)

Total marks – 200

Duration - 3 hours

1. Unit -I ANATOMY & PHYSIOLOGY
 - (i) Embryology & Anatomy
 - (ii) The Physiology of the eye
 - (iii) The Physiology of the vision
 - (iv) The Neurology of vision

2. Unit – II OPHTHALMIC OPTICS
 - (i) Elementary optics
 - (ii) Elementary physiological optics
 - (iii) The determination of the refraction
 - (iv) Errors of refraction
 - (v) Anomalies of accommodation

3. Unit – III THE EXAMINATION OF THE EYE : THERAPEUTICS
 - (i) External examination
 - (ii) Examination of the fundus
 - (iii) The fundus oculi
 - (iv) Examination of retinal function
 - (v) General therapeutics

PAPER – III (TEHCNICAL)

Total marks – 200

Duration - 3 hours

1. Unit – IV DISEASES OF ANTERIOR SEGMENT
 - (i) Diseases of the conjunctiva
 - (ii) Diseases of the cornea
 - (iii) Diseases of the sclera
 - (iv) Diseases of the uveal tract
 - (v) The lens

2. Unit – V DISEASES OF POSTERIOR SEGMENT
 - (i) Diseases of the vitreous
 - (ii) Diseases of the retina
 - (iii) Diseases of the optic nerve
 - (iv) Glaucoma
 - (v) Syntomatic disturbances of vision
 - (vi) Intraocular tumours

3. Unit – VI INJURIES, OPERATIONS AND SYMTOMATIC DISEASES OF THE EYE
 - (i) Injuries to the eye
 - (ii) Operations upon the eyeball
 - (iii) Ocular manifestations of diseases of the nervous system
 - (iv) Immuno pathology of the eye

PAPER – IV (TEHCNICAL)

Total marks – 200
Duration - 3 hours

1. Unit – VII DISORDERS OF MOTILITY OF THE EYES
 - (i) Anatomy and Physiology of the motor mechanism
 - (ii) Paralytic and kinetic strabismus:synkineses:nystagmus
 - (iii) Concomitant strabismus:heterophora
2. Unit – VIII DISEASES OF ADNEXA OF THE EYE
3. Unit – IX PREVENTIVE OPHTHALMOLOGY
4. Unit – X RECENT ADVANCES IN OPHTHALMOLOGY

X. ORTHOPEDICS DEPARTMENT

PAPER – II (TEHCNICAL)

Total marks – 200
Duration - 3 hours

UNIT – I

1. General Principles
2. Reconstructive procedures of the Hip in adults
3. Reconstructive procedures of the knee in adults
4. Reconstructive procedures of the ankle in adults
5. Reconstructive procedures of the shoulder and elbow in adults
6. Amputation
7. Infections
8. Tumors
9. Congenital and developmental disorders

UNIT – II

1. Nervous system disorders in children
2. Fractures and dislocations in children
3. The spine
4. Sports medicine

UNIT – III

1. Arthroscopy
2. Fractures and dislocations in adults
3. Peripheral nerve injuries
4. Microsurgery
5. The hand

PAPER –III (TECHNICAL)

Total marks – 200
Duration - 3 hours

UNIT-I

1. The foot and ankles
2. Basic sciences
3. Physiology and mineralization of bone
4. Physiology of Callag
5. Biophysical properties of bone and cartilage

UNIT-II

1. Metabolic bone diseases bone injection
2. Bone injection

3. Congenital deformities
4. The spine

UNIT-III

1. General defects
2. Developmental conditions
3. Disease of joints

PAPER –IV (TEHCNICAL)

Total marks – 200

Duration - 3 hours

UNIT- I

1. Orthopedic Neurology
2. Tumour of bone
3. Secondary tumours of bone
4. Disease of muscles
5. Fibrous disease
6. Unclassified disease of bone
7. Peripheral vascular disease

UNIT-II

1. The cervical spine
2. Cervicobrachial region
3. The shoulder
4. The elbow
5. The hand
6. The wrist

UNIT-III

1. The hip
2. The knee
3. The foot and the ankle
4. The back
5. The pelvis
6. Radioactive isotopes in clinical orthopaedics
7. Amputations
8. Skin grafting

XI. PAEDIATRICS DEPARTMENT

PAPER- II (TEHCNICAL)

Total marks – 200

Duration - 3 hours

- Basic sciences as applied to Paediatrics
- Neonatology
- General Paediatrics including advances in Paediatrics related to-
 - (i) Nutrition
 - (ii) Growth and development & immunization
 - (iii) Nephrology
 - (iv) Neurology and disabilities
 - (v) Hematology
 - (vi) Oncology

PAPER – III (TECHNICAL)

Total marks – 200
Duration - 3 hours

General Paediatrics including Advances in Paediatrics relating to –

1. Infection diseases
 - (i) Genetics
 - (ii) Immunology
 - (iii) Rheumatology
 - (iv) Psychiatry
 - (v) Behavioral Science
2.
 - (i) Skin
 - (ii) Eye
 - (iii) ENT
3.
 - (i) Adolescent Health
 - (ii) Critical care
 - (iii) Accident
 - (iv) Poisoning
4.
 - (i) Endocrinology
 - (ii) Gastroenterology
 - (iii) Hepatology
 - (iv) Respiratory
 - (v) Cardiovascular

PAPER – IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Research Methodology
2. Applied Paediatric Medicine
3. Recent Advances
4. Community Paediatrics

XII. PATHOLOGY DEPARTMENT

PAPER- II (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. General Principles of Pathology
 - Cellular adaptation cell injury and cell death
 - Acute and chronic inflammation
 - Tissue renewal and repair: Regeneration healing and fibrosis.
 - Hemodynamic disorders, thrombo embolic disease and shock.
 - Genetic Disorders
 - Neoplasia
 - Infectious Diseases
 - Environmental and nutritional pathology
 - Disease of Infancy and Childhood
 - General features of the Immune system
2. Clinical Pathology
 - Complete urine examination with reference to its physical, chemical and special tests.
 - Semen examination – Physical, chemical (pH, Liquefaction time) and microscopic examination.
 - Stool examination – Physical and microscopic examination

PAPER- III (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Haematology (including Techniques and Recent advances)
 - Clinical Correlation
 - Biology of stem cell & disorder of Haematopoiesis.
 - Erythroid maturation, differentiation and abnormality.
 - WBC disorders, complement and immunoglobulin biology
 - Haematological malignancies:-
 - Haematopoietic stem cell transfusion
 - Haemostasis & Thrombosis.
 - Human blood group antigen and antibody.
 - Haematological manifestations of various diseases like liver disorders, renal disorders, infections, cancers, AIDS and Parasitic diseases.
 - Haematological problem in surgical patients.
 - Spleen and its disorders.
 - Current topics and recent advances.
 - Interpretation of a Hemogram
 - Preparation & examination of blood & Bone marrow with relevant special stains
 - Bone marrow aspiration & biopsy procedure
 - ESR
 - Reticulocyte count preparation & interpretation of smear for Reticulocyte count
 - Hemoglobin electrophoresis
 - Osmotic fragility,
 - BT, CT, PTI, PTTK, FDP, Fibrinogen
 - G6PD
 - Fetal Hb
 - Coomb's test
 - Sickling test
 - LE cell phenomenon
2. Cytopathology (Including Techniques and Recent advances)
 - General Cytology
 - Cytology of Female Genital Tract
 - Cytology of Respiratory tract
 - Cytology of GIT
 - Cytology of kidney & lower urinary tract
 - Breast cytology
 - Cytology of thyroid, lymph nodes, neck masses.
 - Cytology of Skin, Bone & Soft tissue
 - Cytology of Liver, Spleen, Pancreas, Retroperitoneum, Abdominal lumps
 - Cytology of Testis & Prostate.
 - Miscellaneous
 - Cytology of all effusions & fluids in the absence as well as presence of cancer.
 - Fixation & staining of smears
 - Processing of fluid specimens
 - Cyto centrifugation
 - Filtration procedures
 - Liquid based cytology
 - Preparation of cell blocks
 - Stains

3. Immunopathology (Including Techniques and Recent advances)
- Disorders of the immune system
 - Agglutination Reactions- Principle, Techniques & practical Applications
 - All tests based on ELISA – Principle, Techniques & practical Applications
 - Protein electrophoresis – Principle, Technique & practical applications
 - Immunoelectrophoresis
 - ANA & ANCA profile
 - Immunohistochemistry Principle, Techniques & Practical Applications
 - Immunofluorescence – Principle, Techniques & Practical Applications
 - RIA (Radio immunoassay) Principle, Techniques & Practical Applications
 - PCR- Principle, Techniques & Practical Applications
 - FISH, CISH, SKY -Principle Techniques & Practical Applications
 - Flow Cytometry- Principle, Techniques & Practical Applications
 - Blot techniques – Principle, Techniques & Practical Applications.

PAPER-IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

1. Systemic Pathology
- Blood vessels, lymphatic and veins
 - Heart
 - Lungs
 - Head and Neck
 - Gastro Intestinal Tract
 - Liver
 - Biliary tract
 - Pancreas
 - Kidney
 - Lower urinary tract and male genital system.
 - Female genital tract
 - Breast
 - The Endocrine System
 - Skin
 - Musculoskeletal system
 - Peripheral nerves and skeletal muscles
 - Central Nervous System
 - Eye
2. Histological techniques
- Principles & application of all types of microscopes e.g. light, electron, fluorescence etc.
 - Tissue processing.
 - Block cutting,
 - Staining - routine (H & E),
 - Mounting and labelling of slides
 - Special stains

XIII. PMR DEPARTMENT

PAPER- II (TECHNICAL)

Total marks – 200

Duration - 3 hours

Basic Sciences and Basic Concepts as applied to Physical Medicine and Rehabilitation

- 1) Basic concepts and philosophy of PMR, definition, scopes and rehabilitation team

- 2) Basic anatomy and physiology of muscle, bones and joints, urogenital, cardio-pulmonary, nervous system, rectum and anal canal
- 3) Biomechanics of shoulder, hip, knee, ankle, foot, spine
- 4) Basic anatomy and physiology related to pain and temperature control
- 5) Physiology of exercise related to aerobic, strength and kinetic chain
- 6) Mechanism of micturition, defecation and deglutition
- 7) Normal growth and development of a child. Normal and abnormal neonatal reflexes
- 8) Basic of biochemical aspects of calcium and vit.D metabolism and osteoporosis
- 9) Basic pharmacology for pain, spasticity, bladder and bowel dysfunction
- 10) Basic principles of urodynamic studies
- 11) Electrodiagnosis-basic principles, application, interpretation, SD curve
- 12) Gait Analysis
- 13) Outcome measures in Physical Medicine and Rehabilitation
- 14) Disability process-impairment, disability,evaluation
- 15) Principles and scope of Occupational Therapy
- 16) Community Based Rehabilitation

PAPER-III (TEHCNICAL)

Total marks – 200
Duration - 3 hours

Principles and practice of physical modalities, prosthetics and orthotics, Rehabilitation management of musculoskeletal conditions, Non-communicable diseases, pain

- 1) Therapeutic exercises
- 2) Physical agents/ Modalities
- 3) Manipulation, traction
- 4) Electricalstimulation,FES
- 5) Rationale of Activities of Daily Living(ADL) in various disease conditions
- 6) Orthosis-spinal orthosis, upper limb, shoes and lower limb orthosis
- 7) Prosthetics
- 8) Rehabilitation of upper and lower limb amputees, complication and their management
- 9) Assistive devices-Mobility aids, wheelchair and seating system
- 10) Low back pain, neck pain, shoulder pain-causes, diagnosis and rehabilitation
- 11) Rehabilitation of Osteoporosis, Rheumatoid arthritis, ankylosing spondylitis, osteoarthritis of knee, hip, spinal deformity
- 12) Rehabilitation of spinal cord injury, stroke, traumatic brain injury, cerebral palsy, poliomyelitis, brachial plexus injury, bells palsy, neuropathy, amputation
- 13) Rehabilitative surgeries- deformity correction in poliomyelitis, cerebral palsy, clubfoot, contractures

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

Legislation, Recent Advances as applied to PMR

- 1) Recent advances related to PMR
- 2) Evidence based Medicine and PMR
- 3) Legislation in relation to disability
- 4) Schemes and benefits extended to persons with disability by the Govt
- 5) Barrie free Environment and access related issues
- 6) Computers in PMR

- 7) Assistive Technology related to PMR
- 8) Ethical aspects in rehabilitation
- 9) Role of rehabilitation in disaster management
- 10) Research methodology

XIV. RADIO IMAGING & DIAGNOSIS DEPARTMENT

PAPER-II (TECHNICAL)

Total marks – 200
Duration - 3 hours

Radiological Anatomy

- Chest
 - Head & Neck
 - Paranasal Sinuses
 - Extremities
 - Abdomen
 - All joints
1. Special Investigations in X-Ray
 - Urinary Systems – IVU, MCU etc.
 - Gastro Intestinal Systems – Barium Swallow, Barium meals study etc.
 - Biliary Systems – T-Tube Cholangiography
 3. Pharmacology
 - Prevention of Drug reactions in IVU studies
 - Different contrast media
 4. Radiation Protections
 - Patient's/Worker's safety
 - Safety measures
 - Protection for pregnant ladies
 - Room layout
 5. Darkroom Procedures & Cassettes
 - Processing
 - Safelight
 - Chemicals
 - Difference signs of Cassettes

PAPER-III (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Medico-Legal Aspects in Radio-diagnosis
 - Age determination in POCSO, Sports etc.
2. Non-Invasive Procedures
 - Ultrasound for
 - Abdomen & Pelvis
 - Obstetrics & Gynaecology
 - Soft parts
 - Gastro Intestinal
 - Joints
3. Emergency Services in Radio-diagnosis
 - X-Ray
 - USG
 - CT Scan
 - MRI

4. Radiation hazards
 - Immediately & Delay

PAPER –IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

1. Intervention Radiology
 - USG Guided FNAC, Aspirations, Biopsy etc.
 - CT Guided FNAC, Aspirations, Biopsy etc
 - Pig tail
 - ERCP
 - MRCP
2. Nuclear Medicines
3. Recent advances in Radio-diagnosis
4. Role of Radio-diagnosis in Medical Sciences

XV. SURGERY DEPARTMENT

PAPER – II (TECHNICAL)

Total marks – 200

Duration - 3 hours

Basic principles of Surgery

1. Investigations, preoperative, intraoperative and post operative care of surgical patients
2. Trauma (Chest, abdomen, limbs and soft tissue) and Neurosurgery
3. Surgical audit, Research and Ethics

PAPER – III (TECHNICAL)

Total marks – 200

Duration - 3 hours

1. Gastro intestinal Surgery – from basic to advanced
2. Surgical breast diseases (benign and malignant) and other endocrine surgery (adrenal, thyroid, pancreas etc.)
3. Cardiothoracic and Vascular Surgery (varicose veins, av malformation, haemangioma etc.)
4. Head and Neck Surgery: Benign and Malignant with congenital diseases

PAPER – IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

1. Urology (stone diseases, tumours, BPH, testicular diseases etc.)
2. Paediatric Surgery : neonatal surgery, congenital anomalies, paediatric urology, paediatric oncology etc)
3. Surgical oncology : Including basic medical and radiation oncology
4. Plastic Surgery and Burns
5. Recent advances in Surgery

Recommended Textbooks (Latest editions) and Journals

1. Bailey and Love's Short Practice of Surgery
2. Schwartz's Principles of Surgery
3. Farguharson's Textbook of Operative General Surgery
4. Pye's Surgical Handicraft
5. Recent advances in Surgery (India and International)
6. Surgical Essence/Surgery for PGME
7. Standard Surgical Journals (India and International)
8. Maingot's abdominal Surgery
9. Sabiston's textbook of Surgery

XVI. PUBLIC HEALTH DEPARTMENT

PAPER - II) TECHNICAL)

Total marks – 200
Duration - 3 hours

- 1) Introduction
 - 1.1 Prevention of diseases in the community
 - 1.2 health situation- past & present
 - 1.3 History of public health
 - 1.4 Place & role of preventive medicine in development of social medicine, community health, community medicine.

- 2) Applied aspects of Preventive Medicine
 - 2.1 Health
 - 2.1.1 Changing concepts
 - 2.1.2 Definition
 - 2.1.3 Dimensions
 - 2.1.4 Concepts of wellbeing
 - a) PQLI
 - b) HDI
 - 2.1.5 Spectrum of Health
 - 2.1.6 Determinants of Health
 - 2.1.7 Rights & responsibilities
 - 2.1.8 Indicators of health
 - a) Mortality
 - b) Morbidity
 - c) Disability
 - d) Others
 - 2.1.9 Health care system
 - a) Characteristics
 - b) Levels
 - c) Primary Health Care
 - 2.2 Disease
 - 2.2.1 Concept
 - 2.2.2 Natural history of diseases
 - a) Epidemiological triad
 - b) Risk factors
 - 2.3 Concepts of control
 - 2.4 Concepts of prevention
 - 2.4.1 Modes of interventions
 - 2.4.2 Levels of preventive health services (urban & rural)
 - 2.5 Health Management

- 3) Biostatistics
 - 3.1 Introduction
 - 3.2 Data
 - 3.2.1 Sources & uses of data.
 - 3.2.2 Types of data
 - 3.2.3 Collection & Presentation
 - 3.3 Centering constants

- 3.3.1 Measures of variation
 - 3.3.2 Normal, Binomial & Poisson distribution
 - 3.3.3 Concept of probability
 - 3.4 Sampling methods
 - 3.5 Test of significance
 - 3.6 Correlation & regression
 - 3.7 Clinical Trial
 - 3.8 Statistical fallacies
 - 3.9 Non-parametric tests
 - 3.10 Statistical exercises
 - 3.11 Operational research.
 - 3.11 Vital statistics
 - 3.11.1 Sources of vital statistics
 - 3.11.2 Registration system
 - 3.11.3 Definition & uses
 - 3.11.4 Morbidity & mortality rates
 - 3.11.5 Standardization of death rates
 - 3.11.6 Life –table
 - 3.11.7 Fertility rates
 - 3.12 Use of computers & their application in Public Health.
- 4) Environment & Health Planning and management for provision of safe water
- 4.1 WATER
 - 4.2. Water in relation of health & diseases
 - 4.2.1 Sources & uses
 - 4.2.2 Pollution
 - 4.2.3 Purification
 - a) On large scale
 - i) Storage
 - ii) Filtration
 - iii) Disinfection
 - b) On small scale
 - i) Household level
 - ii) Disinfection of well
 - 4.2.4 Quality
 - a) Criteria & standards
 - 4.2.5 Hardness of water
 - 4.2.6 Swimming pool sanitation
 - 4.2.7 Horrock's apparatus
 - 4.2.8 Public health laboratory and its functions in this context
 - 4.3 Air & health
 - 4.3.1 Indices of thermal comfort
 - 4.3.2 Pollution
 - a) Sources
 - b) Pollutants
 - c) Monitoring
 - d) Effects
 - e) Prevention & control
 - 4.4 Housing

- 4.4.1 Social goal
- 4.4.2 Standards
- 4.4.3 Housing & health
- 4.4.4 Overcrowding
- 4.4.5 Indicators
- 4.5 Industrialization & health
- 4.6 Radiation & health
 - 4.6.1 Sources
 - 4.6.2 Types
 - 4.6.3 Units
 - 4.6.4 Biological effects
 - 4.6.5 Protection
- 4.7 Air temperature
 - 4.7.1 Measurement
 - 4.7.2 Effects of heat on human health
 - 4.7.3 Effects of cold on human health
 - 4.7.4 Global warming
- 4.8 Hazardous wastes & health
 - 4.8.1 Planning and management of safe disposal of solid waste
 - 4.8.2 planning and management of safe disposal of bio-medical waste
- 4.9 Noise & health
 - 4.9.1 Sources
 - 4.9.2 Properties
 - 4.9.3 Effects
 - 4.9.4 Control
- 4.10 Safe Disposal of Municipal waste
 - 4.10.1 Liquid waste
 - 4.10.2 Solid Waste
- 5) Nutrition & Health
 - 5.1 Chemistry & physiology of food
 - 5.2 Nutritive value of food & planning of balanced diet
 - 5.3 Food processing & preservation
 - 5.4 Nutritional problems
 - 5.4.1 LBW
 - 5.4.2 PEM
 - 5.4.3 Xerophthamia
 - 5.4.4 Nutritional anaemia
 - 5.4.5 IDD
 - 5.4.6 Endemic flurosis
 - 5.5 Nutritional factors in selected diseases
 - 5.6 Nutritional assessment
 - 5.7 Nutritional surveillance & growth monitoring
 - 5.8 Food hygiene- inspection & legal provisions
 - 5.9 Food toxicants, food addition, food fortification, food adulteration
 - 5.10 Food standards
 - 5.11 National Nutrition Policy & Programmes
 - 5.12 Applied aspects of nutrition (dietetics)
 - 5.13 I.F.S.A. and BPMC acts in relation to prevention of food adulteration and various licencing procedure related to them

- 6) Mental health
 - 6.1 Health & diseases
 - 6.2 Concept of
 - a) Normality
 - b) Mental health
 - 6.3 Magnitude of the problem
 - 6.4 Prevention of mental diseases
 - 6.5 Alcohol related & drug related problems
 - 6.6 Mental health services in India.
- 7) Geriatric Health
- 8) Occupational Health
 - 8.1 Definition
 - 8.2 Ergonomics
 - 8.3 Occupational diseases & their prevention
 - 8.4 Occupation related legislation
 - 8.5 Sickness absenteeism
 - 8.6 Social security
 - 8.7 Organization of services.
- 9) International Health & Telemedicine
- 10) Role of NGO in health care delivery system
- 11) Public Health Chemistry

PAPER - III (TECHNICAL)

Total marks – 200
Duration - 3 hours

- 1) Epidemiology - 30
 - 1.1 Definition & aims
 - 1.2 Epidemiological approach
 - 1.3 Basic measurement in Epidemiology
 - 1.4 Types of Epidemiological studies
 - 1.4.1 Observational
 - a) Descriptive
 - b) Analytic
 - 1.4.2 Experimental
 - 1.5 Association & causation
 - 1.6 Uses of Epidemiology
 - 1.7 Infectious disease Epidemiology
 - 1.8 Investigation of an epidemic of Leptospirosis, Malaria, Dengue in Urban set Up & in post disaster situations
 - 1.9 Health advice to travelers
 - 1.10 Disinfection
 - 1.11 Control of hospital acquired infections
 - 1.12 Screening for diseases
- 2) Microbiology
 - 2.1 General characteristics & morphology
 - 2.2 Laboratory techniques used in the study of microbial agents of public health importance.

- 2.3 Collection & forwarding of different samples for bacteriological & serological analysis
 - 2.4 Serological reactions
 - 2.5 Immunity.
- 3) Protozoology
- 3.1 General characteristics
 - 3.2 Classification & Morphology
 - 3.3 Disease causation
 - 3.4 Laboratory techniques used in the study & control of protozoal infestations of public health importance.
- 4) Entomology
- 4.1 General characteristics
 - 4.2 Classification & Morphology
 - 4.3 Bionomics
 - 4.4 Disease transmission & control of insects of public health importance.
- 5) Helminthology
- 5.1 General characteristics
 - 5.2 Classification & Morphology
 - 5.3 Life cycle of helminthes
 - 5.4 Natural history of diseases
 - 5.5 Prevention & control of helminthes of public health importance
- 6) Epidemiology of communicable diseases
- 6.1 Exanthematous fevers
 - 6.2 Air borne infections
 - 6.3 Contact infections
 - 6.4 Water-borne & food borne disease
 - 6.5 Vector-borne diseases
 - 6.6 Zoonotic diseases
 - 6.7 Surface infections
 - 6.8 Emerging & re-emerging infectious diseases
 - 6.9 Hospital acquired infections
 - 6.10 National Health programmes for control/ elimination/ eradication of communicable diseases.
- 7) Epidemiology of non-communicable diseases
- 7.1 Cardiovascular diseases
 - 7.2 Cancer
 - 7.3 Diabetes mellitus
 - 7.4 Disasters
 - 7.5 Blindness
 - 7.6 Accidents
 - 7.7 Obesity.
- 8) Social sciences
- 8.1 Medical sociology
 - 8.2 Social Anthropology
 - 8.3 Introduction to social sciences & their application in public health.

- 9) Medical Ethics
- 10) Demography & Population Control
 - 10.1 Introduction
 - 10.1.1 Definition
 - 10.1.2 Demographic cycle
 - 10.1.3 Population Pyramid
 - 10.2 Fertility
 - 10.2.1 Factors affecting fertility
 - 10.2.2 Indicators of fertility
 - 10.3 Population explosion as a public health problem
 - 10.4 Approaches for population control.
 - 10.4.1 Family planning
 - a) Definition
 - b) Scope
 - c) Health aspects
 - d) Methods
 - i) Spacing methods
 - ii) Terminal methods
 - 10.5 Delivery system
 - 10.6 National family welfare programme

PAPER - IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

- 1) National Health Programme in India
 - 1.1 National Anti Malaria Programme
 - 1.2 Revised National Tuberculosis control Programme
 - 1.3 National Leprosy Elimination Programme
 - 1.4 National Filaria Control Programme
 - 1.5 National Family Welfare Programme
 - 1.6 Universal immunization Programme
 - 1.7 Reproductive & child health Programme
 - 1.8 ICDS
 - 1.9 National Programme for control of blindness
 - 1.10 National Cancer control Programme
 - 1.11 National water supply & sanitation Programme
 - 1.12 National mental health Programme
 - 1.13 National AIDS control Programme
 - 1.14 National Acute Diarrheal Disease control Programme
 - 1.15 National Iodine Deficiency Disorder control Programme
 - 1.16. National Vector borne diseases Control Programme
 - 1.17 National Control for Non-Communicable Diseases
- 2) Reproductive & Child Health (RCH)
 - 2.1 Introduction
 - 2.1.1 Mother & Child as one unit
 - 2.2 Care of mother during
 - 2.2.1 Antenatal period

- 2.2.2 Intranatal period
 - 2.2.3 Postnatal period
 - 2.3 Care of children
 - 2.3.1 Neonatal care
 - 2.3.2 Care of infant
 - a) Feeding of infants
 - b) Immunization
 - 2.4 Care of pre-school child
 - 2.5 Growth & development
 - 2.6 School health
 - 2.7 Adolescent health
 - 2.8 Indicators of RCH services
 - 2.9 Reproductive & child health (RCH) Programme & services
 - 2.10 Postpartum Programme
 - 2.11 Family welfare programmes
 - 2.12 Child labour.
- 3) Health care delivery system
- 3.1 Patterns of health care delivery
 - 3.2 History of development of health care delivery system in India
 - 3.3 Reports of different committees
 - 3.4 Three-tier health care delivery system
 - 3.4.1 Primary health center
 - 3.4.2 Subcentre
 - 3.4.3 CHV
 - 3.5 Urban health infrastructure.
- 4) Health management & health planning
- 22.1 Definition
 - 22.2 Planning cycle
 - 22.3 Management methods & techniques (PERT, CPM)
 - 22.4 Personnel, financial & material management.
 - 22.5 Principles of planning of health services at district/ PHC level.
 - 22.6 Activity planning for epidemics, floods refugees
 - 22.7 Hospital Management.
- 5) Health Economics
- 5.1 Basics of Health Economics
 - 5.2 Cost trends, Demand & Supply
 - 5.3 Price Elasticity
 - 5.4 Health Insurance
 - 5.5 Ginni Co efficient, Kankavani index
- 6) Public health administration
- Public health administration including relevant laws & Public Private Partnership like ChiranjiviYojana, Baal Sakhayajana , EMRI.
- 7) Health Education & Communication

XVI. MICROBIOLOGY DEPARTMENT

PAPER II (TECHNICAL)

Total marks – 200

Duration - 3 hours

1. General Microbiology
 - i. History of microbiology
 - ii. Microscopy
 - iii. Bio-safety including universal containment, personal protective equipment for biological agents
 - iv. Physical and biological containment
 - v. Isolation precautions including standard precautions and transmission based precautions
 - vi. Sterilization, disinfection and lyophilization
 - vii. Morphology of bacteria and other microorganisms
 - viii. Nomenclature and classification of microorganisms
 - ix. Normal flora of humanbody
 - x. Growth and nutrition of bacteria
 - xi. Bacterial metabolism
 - xii. Bacterial toxins
 - xiii. Bacteriocins
 - xiv. Microbiology of hospital environment
 - xv. Microbiology of air, milk and water
 - xvi. Host-parasite relationship
 - xvii. Antimicrobial agents and mechanisms drug resistance
 - xviii. Bacterial genetics and bacteriophages
 - xix. Molecular genetics relevant for medical microbiology
 - xx. Quality assurance and quality control in microbiology
 - xxi. Accreditation of laboratories

2. Systematic bacteriology
 - i. Isolation and identification of bacteria
 - ii. Gram positive cocci of medical importance including Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci etc.
 - iii. Gram negative cocci of medical importance including Neisseria, Branhamella, Moraxella etc.
 - iv. Gram positive bacilli of medical importance including Lactobacillus, Coryneform organisms, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
 - v. Gram negative bacilli of medical importance including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.
 - vi. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus, Spirillum and miscellaneous bacteria
 - vii. Enterobacteriaceae
 - viii. Mycobacteria
 - ix. Spirochaetes
 - x. Chlamydia
 - xi. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
 - xii. Rickettsiae, Coxiella, Bartonella etc.

PAPER III (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Mycology
 - i. General characteristics and classification of fungi
 - ii. Morphology and reproduction of fungi
 - iii. Isolation and identification of fungi
 - iv. Tissue reactions to fungi
 - v. Yeasts and yeast like fungi of medical importance including *Candida*, *Cryptococcus*, *Malassezia*, *Trichosporon*, *Geotrichum*, *Saccharomyces* etc.
 - vi. Mycelial fungi of medical importance including *Aspergillus*, *Zygomycetes*, *Pseudallescheria*, *Fusarium*, *Piedra*, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
 - vii. Dimorphic fungi including *Histoplasma*, *Blastomyces*, *Coccidioides*, *Paracoccidioides*, *Sporothrix*, *Penicillium marneffei* etc.
 - viii. Dermatophytes
 - ix. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
 - x. *Pythium insidiosum*
 - xi. *Prototheca*
 - xii. *Pneumocystis jirovecii* infection
 - xiii. *Rhinosporidium seeberi* and *Lacazia loboi* (*Loboaloboi*)
 - xiv. Laboratory contaminant fungi
 - xv. Mycetism and mycotoxicosis
 - xvi. Antifungal agents and in vitro antifungal susceptibility tests.
2. Virology
 - i. General properties of viruses
 - ii. Classification of viruses
 - iii. Morphology: Virus structure
 - iv. Virus replication
 - v. Isolation and identification of viruses
 - vi. Pathogenesis of viral infections
 - vii. Genetics of viruses
 - viii. DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova and Parvo viruses etc.
 - ix. RNA viruses of medical importance including Enteroviruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reo viruses, Rhabdoviruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human immunodeficiency virus, Arbo viruses, Corona viruses, Calci viruses etc.
 - x. Slow viruses including prions
 - xi. Unclassified viruses
 - xii. Hepatitis viruses
 - xiii. Virioids, prions
 - xiv. Vaccines and anti-viral drugs.

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Parasitology
 - i. General characters and classification of parasites.
 - ii. Methods of identification of parasites

- iii. Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium, Cyclospora, Babesia, Balantidium, etc.
 - iv. Helminthology of medical importance including those belonging to Cestoda (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps etc.), Trematoda (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematoda (etc.)
 - v. Entomology: common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myiasis.
 - vi. Anti-parasitic agents.
2. Immunology
- i. Components of immune system
 - ii. Innate and acquired immunity
 - iii. Cells involved in immune response
 - iv. Antigens
 - v. Immunoglobulins
 - vi. Mucosal immunity
 - vii. Complement
 - viii. Antigen and antibody reactions
 - ix. Hypersensitivity
 - x. Cell mediated immunity
 - xi. Cytokines
 - xii. Immunodeficiency
 - xiii. Auto-immunity
 - xiv. Immune tolerance
 - xv. MHC complex
 - xvi. Transplantation immunity
 - xvii. Tumor immunity
 - xviii. Vaccines and immunotherapy
 - xix. Measurement of immunological parameters
 - xx. Immunological techniques
 - xxi. Immunopotential and immunomodulation
3. Applied Microbiology
- ii. Epidemiology of infectious diseases
 - iii. Antimicrobial prophylaxis and therapy
 - iv. Hospital acquired infections
 - v. Management of biomedical waste
 - vi. Investigation of an infectious outbreak in hospital and community
 - vii. Infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.
 - viii. Opportunistic infections
 - ix. Sexually transmitted diseases
 - x. Vaccinology: principles, methods of preparation, administration of vaccines, types of vaccines
 - xi. Information technology (Computers) in microbiology

- xii. Automation in Microbiology
- xiii. Molecular techniques in the laboratory diagnosis of infectious diseases
- xiv. Statistical analysis of microbiological data and research methodology
- xv. Animal and human ethics involved in microbiological work.
- xvi. Safety in laboratory and Laboratory management

XVII. PAEDIATRIC SURGERY DEPARTMENT

PAPER II (TECHNICAL)

Total marks – 200

Duration - 3 hours

Basic Science & General

1. Molecular clinical genetics & gene therapy in Pediatric Surgical practice
2. Embryology of malformation & prenatal diagnosis of surgical diseases
3. Fetal Surgery & neonatal surgical emergency
4. Fluid & electrolyte balance and nutrition in neonates & children
5. Transport of the surgical patient, preoperative assessment and postoperative management
6. Burns & Corrosive poisoning
7. Trauma of the head & neck, traumatic brain injury
8. Blunt trauma & penetrating injuries of the torso

PAPER III (TECHNICAL)

Total marks – 200

Duration - 3 hours

Systemic

1. Craniofacial anomalies
2. Surgical diseases of the thyroid and parathyroid glands
3. Cysts of the lungs & infectious diseases of the lungs and pleura
4. Congenital Diaphragmatic Hernia & abdominal wall defects
5. Hepatobiliary surgery
6. Hypertrophic pyloric stenosis, intussusception, Meckel's diverticulitis, appendicitis, Crohn's disease and ulcerative colitis
7. Hirschsprung disease
8. Anomalies of the scrotum and the penis

PAPER IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

Special Areas of Pediatric Surgery

1. Conjoint twins
2. Hydrocephalus & Neural tube defects
3. Vascular anomalies & lymphatic disorders
4. Major tumors of childhood
5. Chemotherapy & Radiation oncology in Children
6. Transplantation in children
7. Bariatric Surgery
8. Minimal Invasive Surgery in Children

XVIII. TRANSFUSION MEDICINE DEPARTMENT

PAPER II (TECHNICAL)

Total marks – 200
Duration - 3 hours

(Applied Aspects Of Basic Science)

- I. History of Transfusion Medicine:
 - 1.1. Landmarks in the evolution of Transfusion Medicine.
 - 1.2. Changing trends in the practice of Transfusion Medicine.
 - 1.3. Development of Transfusion Medicine during wars.

- II. Physiology and Biochemistry of blood:
 - 2.1. Metabolism of Morphology and Blood Cells.
 - 2.2. Haemoglobin structure and functions.
 - 2.3. Kinetics and functions of cellular elements of blood.
 - 2.4. Plasma Protein Mechanism of Coagulation.
 - 2.5. Haemodynamics of circulation.
 - 2.6. Pathophysiology of blood donation.
 - 2.7. Pathophysiology of haemorrhagic shock
 - 2.8. Pathophysiology of Disseminated Intravascular Coagulation.
 - 2.9. Biochemical and haematological alternations during storage.

- III. Genetics:
 - 3.1. Principles of genetics and inheritance.
 - 3.2. Immunogenetics and blood groups.
 - 3.3. Applied Genetics.
 - 3.4. Anthropology.

- IV. Blood groups:
 - 4.1. Biochemical structure of major blood group antigens
 - 4.2. Blood group antibodies

- V. Immunology:
 - 5.1. Fundamentals of immunology and immunological techniques.
 - 5.2. Immunology, Immune response Immunoglobulin.
 - 5.3. Immunological basis of Iso sensitization
 - 5.4. Antigens, Antibodies, complement, Immune response and antihuman globulin test.

PAPER III (TECHNICAL)

Total marks – 200
Duration - 3 hours

(Immunohaematology, Immunogenetics And Applied Serology)

- I. Fundamentals of Immunohaematology
 - 6.1. Biochemical properties and characteristics of blood group antigens and antibodies.
 - 6.2. Identifications of natural and Immune antibodies.
 - 6.3. Leucocyte antigens and antibodies.
 - 6.4. Platelet antigens and antibodies.

- II. Blood group systems
 - 7.1. Blood groups and disease associations.
 - 7.2. Serological techniques for blood group antigens and antibodies.

- 7.3. Blood group reagents, Polyclonal and Monoclonal.
- 7.4. Blood group substances.
- 7.5. Applied serology

- III. Autoimmunity
 - 8.1. Autoimmune diseases.
 - 8.2. Haemolytic anaemia.
 - 8.3. Thrombocytopenia.

- IV. Haemolytic disease of the new born
 - 9.1. Etiopathogenesis, Investigations and management.
 - 9.2. Antenatal serology and Rh immunization.
 - 9.3. Role of immunoglobulin in prevention of HDN.

- V. Medicolegal Considerations
 - 10.1. Problems of disputed paternity.
 - 10.2. Medicolegal considerations in Transfusion Practice.
 - 10.3. Forensic Serology. 19.4. Community Medicine related to Transfusion Medicine.

- VI. Transplantation
 - 11.1. HLA typing.
 - 11.2. Transfusion practice in Organ transplantation.
 - 11.3. Bone Marrow transplantation.
 - 11.4. Graft / Host reaction.

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

(Blood Centre Operation, Donor Organisation, Blood Preservation And Technology Of Components, Clinical Hemotherapy)

- I. Organisation and Management of transfusion services
 - 12.1. Organisation and functions of blood centre
 - 12.2. Donor motivation,recruitment and retention
 - 12.3. Blood donation camps
 - 12.4. Records and Statistics
 - 12.5. Inventory management.
 - 12.6. Accreditation of blood banks.

- II. Blood Collections and Processing
 - 13.1. Management of blood donation, criteria for selection, screening procedures, risks and management of donor complications.
 - 13.2. Blood collection procedures.
 - 13.3. Screening of collected blood for infectious.
 - 13.4. Directed and autologous donations.
 - 13.5. Preservations and storage of blood and components.
 - 13.6. Preparation and standardisation of blood components.
 - 13.7. Plasma fractionation.
 - 13.8. Cryopreservation.

- III. Quality control and Instrumentation
 - 14.1. Total quality management.
 - 14.2. Automation and computerisation in transfusion practice.
 - 14.3. Electronics, software and Plastics in transfusion medicine.
 - 14.4. Safety measures, Sterilization and disposal procedures in transfusion technology.
- IV. Reagents and preservatives solutions
 - 15.1. Production Standardization of biological reagents.
 - 15.2. Anticoagulant Solutions.
 - 15.3. Cell panels.
- V. Pretransfusion testing
 - 16.1. Basic procedures and Techniques for compatibility testing.
 - 16.2. Emergency and elective techniques.
 - 16.3. Typing and Screening.
 - 16.4. Micro techniques for cross matching.
- VI. Transfusion of blood and blood components
 - 17.1. Clinical considerations, in transfusion practice.
 - 17.2. Indications for whole blood, red cells, platelets, cryoprecipitate and other components.
 - 17.3. Optimal use of blood and blood components.
 - 17.4. Massive transfusion
 - 17.5. General Surgical and medical support.
 - 17.6. Coagulopathies, thrombocytopenia, various haematological disorders, haemophilia and disseminated Intra Vascular Coagulation.
 - 17.7. Neonatology and Paediatrics transfusion
 - 17.8. Autologous transfusion
 - 17.9. Exchange transfusion
- VII. Hazards of blood transfusion and their managements.
 - 18.1. Nature of transfusion reactions.
 - 18.2. Immunological and non immunological reactions.
 - 18.3. Non Immunological reaction.
 - 18.4. Etiopathogenesis, investigation and management of transfusion reactions.
 - 18.5. Transmittable diseases Hepatitis, HIV Syphilis, Malaria etc - Detection and outline of management.
- VIII. Artificial blood and blood related products
 - 19.1. Synthetic Oxygen carrying compounds perfluor carbons and Hb solutions.
 - 19.2. Volume expanders, Crystalloids, natural and synthetic colloids.
- IX. Apheresis
 - 20.1. Plasmapheresis - manual and machine
 - 20.2. Cytapheresis
 - 20.3. Therapeutic apheresis.
 - 20.4. Plasma exchange.

XIX. PLASTIC AND RECONSTRUCTIVE SURGERIES DEPARTMENT

PAPER II (TEHCNICAL)

Total marks – 200
Duration - 3 hours

General Principles, Face, Cleft Lip & Palate And Craniofacial Abnormalities.

General Principles:

1. History of Plastic Surgery and its broad scope at the present time.
2. Anatomy and functions of skin.
3. Split skin grafts and full thickness skin grafts, their take and Subsequent behaviour.
4. Local skin flaps.
5. Pedicled skin flaps and tubs.
6. Unstable scar and scar contracture.
7. Care of wounds, dressing, techniques and splints.
8. Wound healing.
9. Grafts – fat, fascia, tendon, nerve, cartilage, bone.
10. Infective skin gangrene.
11. Hospital infections.
12. Suture instruments.
13. Implant materials used in Plastic Surgery.
14. Principles of genetics and general approach to the management of congenital malformations.
15. Flaps-Fasciocutaneous muscle, musculocutaneous, congenital malformations.
16. Local anaesthesia, nerve blocks, regional anaesthesia.
17. Principles of anaesthesia for infants, adults, hypothermia, hypertensive naesthesia.
18. Tissue expansion.
19. Keloid, hypertrophic scars.
20. Endoscopy in Plastic Surgery.

Face

1. Growth and development changes in face, anatomy of facial skeleton.
2. Structure and development of teeth.
3. Leprosy deformities of face.
4. Temporomandibular joint dysfunctions.
5. Fractures- nose, maxilla, mandible, zygoma, orbit-early management and treatment of sequelae.
6. Rhinoplasty.
7. Facial paralysis.
8. Reconstruction of external ear.
9. Reconstruction of eyelids, ptosis.
10. Congenital deformities of face and jaw bone.

Cleft Lip and Palate and Craniofacial Anomalies

1. Embryology & Regional anatomy of head and neck.
2. Cleft lip and palate, alveolar clefts & Velopharyngeal incompetence.
3. Orthodontics, speech therapy in cleft lip and palate.
4. Principles of craniofacial surgery.
5. Rare craniofacial clefts, Tessier's clefts, Craniosynostosis, hypertelorism, craniofacial microsomia.

Tomours of Head and Neck and Skin

1. Vasoformative lesions of the skin and adenexa& Tumour of skin.

2. Jaw tumours and Cancer of upper Aerodigestive system.
3. Reconstruction of mandible.
4. Reconstruction of maxilla.
5. Malignant and benign tumours of head and neck and their management.

PAPER III (TECHNICAL)

Total marks – 200

Duration - 3 hours

Trunk, Aesthetic Surgery, Microvascular Surgery&Burns Surgery

Trunk

1. Reconstruction of full thickness defects of the abdomen and thorax.
2. Decubitus ulcer.
3. Breast embryology
4. Breast cancer surgery
5. Breast reconstruction

Aesthetic Surgery

1. Chemical peeling and dermabrasion.
2. Non-surgical and Surgical facial rejuvenation.
3. Implants and prosthesis
4. Blepharoplasty.
5. Fat grafting
6. Tissue fillers
7. Mesotherapy
8. Face lift.
9. Abdominoplasty.
10. Body contouring, liposuction.
11. Reduction mammoplasty.
12. Augmentation mammoplasty.
13. Buttock augmentation
14. Laser therapy.
15. Aesthetic Rhinoplasty.

Microvascular Surgery

1. Principles of microsurgery and its applications in plastic surgery.
2. Vascular anatomy and its applied sciences.
3. Replantation and revascularization surgery.
4. Transplantation Surgery.
5. Microvascular tissue transfers.

Burns Surgery

1. Thermal burns.
2. Electrical burns.
3. Chemical burns.
4. Radiation burn.
5. Pathophysiology of burn shock.
6. Nutrition in burns.
7. Facial burns.
8. Paediatric burns.

9. Burns management and rehabilitation
10. Tangential excision and sequential excision.
11. Reconstruction of burn hand and upper extremity.
12. Post burn contractures –treatment of sequelae.
13. Burn wound infection, sepsis.
14. Principles of planning in event of burn disaster.
15. Organization of Burns Unit.

PAPER IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

Hand, Lower Extremity & Genitourinary System.

Hand

1. Embryology and functional anatomy of upper extremity.
2. Examination of hand & General principles of hand surgery.
3. Treatment of acute hand injuries.
4. Finger tip injuries.
5. Flexor tendon injuries.
6. Extensor tendon injuries.
7. Principles of reconstruction in mutilating hand injuries.
8. Fractures of hand and dislocation of hand –metacarpal, phalanges.
9. Nail injuries, grafting.
10. Pollicisation.
11. Thumb reconstruction.
12. Peripheral nerve injuries, electro diagnostic tests.
13. Brachial plexus injury.
14. Innervated flaps.
15. Vascular malformations of upper extremity.
16. Lymphedema in upper extremity.
17. Ischaemic conditions of upper extremity.
18. Vasospastic conditions of upper extremity.
19. Nerve compression syndromes.
20. Surgery for spastic and tetraplegic hand.
21. Problems of small joints.
22. Dupuytren's disease.
23. Principles and treatment of old and neglected hand deformities.
24. Rheumatoid arthritis of hand.
25. Hand infections.
26. Congenital deformities of hand, finger, thumb.
27. Tendon transfers for radial, ulnar and median nerve injury.
28. Leprosy deformity of hand.
29. Benign and malignant tumours of hand.
30. Rehabilitation of hand, prosthesis.

Lower Extremity

1. Functional anatomy of foot.
2. Lymphedema.
3. Reconstructive surgery of lower extremity.
4. Leprosy deformities of leg and foot.

Genito Urinary System

1. Embryology of the male and female external genitalia.
2. Anatomy of the male and female external genitalia.
3. Hypospadias, Epispadias and ectopic vesicae.
4. Reconstruction of external genitalia.
5. Vaginoplasty.
6. Trans-sexualism (intersex).

XX. OBSTETRICS & GYNECOLOGY DEPARTMENT
PAPER II (TECHNICAL)Total marks – 200
Duration - 3 hours

Basic Sciences as applied to OBG

- 1) Normal & abnormal development, structure and function of female urogenital system and female breast
- 2) Applied Anatomy of female genito-urinary system
- 3) Physiology of spermatogenesis, Gametogenesis, fertilisation, implantation & early development of embryo
- 4) Endocrinology and Physiology during puberty, adolescence, menstruation, ovulation, fertilization, climacteric & menopause
- 5) Development, structure & function of placenta, umbilical cord & amniotic fluid (normal and abnormal)
- 6) Anatomical, biochemical, endocrine & physiological changes in female genital tract during pregnancy
- 7) Anatomy of fetus, fetal growth & development, fetal physiology & fetal circulation
- 8) Physiological changes during pregnancy, labour and Puerperium
- 9) Pharmacology of drugs used during pregnancy, labour, post partum period in reference to their absorption, distribution, excretion, (hepatic) metabolism, transfer across the placenta, effect of the drugs (used) on labour, on fetus, their excretion through breast milk and gynecology
- 10) Role of hormones in Obstetrics & Gynaecology.

PAPER III (TECHNICAL)

Total marks – 200
Duration - 3 hours

Clinical Obstetrics & Neonatology

- 1) Identification and management of complications of pregnancy & abortions, ectopic pregnancy, gestational trophoblastic disease, hyperemesis gravidarum, multiple pregnancy, antepartum hemorrhage, pregnancy induced hypertension, preclampsia, eclampsia, other associated hypertensive disorders, anemia, Rh incompatibility, diabetes, heart disease, renal & hepatic diseases, preterm pregnancy and post term pregnancy, intrauterine fetal growth retardation, hydramnios, oligoamnios, premature rupture of membranes, recurrent pregnancy loss.
- 2) Evaluation of fetal & maternal health in complicated pregnancy by making use of diagnostic modalities including modern ones (USG, Doppler, Electronic monitors) and plan for safe delivery for mother and fetus. Identifying fetus at risk & its management.
- 3) Infections in pregnancy (Bacterial, viral, fungal, protozoal) -Malaria, Toxoplasmosis, Rubella, Cytomegalovirus Herpes, HIV, Hepatic viral infections (B,C etc.), Sexually transmitted infections (STDs), Mother to fetus transmission of infections,
- 4) Identification & management of fetal malpositions and malpresentations
- 5) Management of pregnancies complicated by medical, surgical (with other specialities as required) & gynaecological diseases. Anemia, hematological disorders, Respiratory, Heart, Renal, Liver, skin diseases, Gastro Intestinal, Hypertensive, Autoimmune, Endocrine disorders, Associated

Surgical Problems. Acute Abdomen (surgical emergencies of appendicitis & gastrointestinal emergencies). Other associated surgical problems. Gynaecological disorders associated with pregnancy- congenital genital tract developmental anomalies, gynaepathologies- fibroid uterus, Carcinoma Cervix, genital prolapse etc. Hematological problems in obstetrics including coagulation disorders. Use of blood and blood components/ products

- 6) Obstetric Analgesia and anesthesia
- 7) HIV infections in pregnancy, its effects and management and PPTCT Program
- 8) Imaging techniques in Obstetrics
- 9) Prenatal screening, diagnosis, and therapy of developmental anomalies
- 10) Pre pregnancy counseling, General Neonatology.

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

General Gynecology & Contraception

- 1) Epidemiology and etiopathogenesis of gynaecological disorders in women of all age group
- 2) Diagnostic modalities and management of common benign and malignant gynaecological diseases (diseases of the genital tract)
- 3) Rational approach in diagnosis and management of endocrine, abnormalities such as: menstrual abnormalities, amenorrhea (primary/ secondary), abnormal uterine bleeding, Polycystic ovarian disease, hyperprolactinemia (galactorrhea), hyperandrogenism, thyroid-pituitary-adrenal disorders
- 4) Fibroid uterus, Endometriosis & adenomyosis, Genital prolapse (uterine & vaginal)
- 5) Benign, Premalignant and Malignant lesion of Vulva, vagina, cervix, uterus tubes and ovaries
 - Gestational Trophoblastic diseases
 - Diagnosis and surgical management of clinical conditions related to congenital malformations of genital tract including Reconstructive surgery in gynaecology
 - Intersex, ambiguous sex and chromosomal abnormalities.
- 6) Reproductive endocrinology- Evaluation of Primary/ Secondary Amenorrhea, management of hyperprolactinemia, Hirsutism, Chronic anovulation, Polycystic Ovarian Disease, thyroid and other endocrine dysfunctions.
 - Urological problems in gynaecology or diagnosis and management of - Urinary tract Infection, Urogenital fistulae, Incontinence, Other Urological problems
- 7) Menopause : management (Hormone replacement therapy) and prevention of its complications
 - Endoscopy (Laparoscopy Hysteroscopy)
 - Principles of radiotherapy and chemotherapy in gynaecological malignancies, Choice, schedule of administration & complications of such therapies
 - Preventive Oncology
- 8) Infertility workup evaluation and management of infertile couple
 - Basic knowledge of Assisted Reproductive Techniques (ART)
 - Reproductive Tract Infection including HIV infection in women of reproductive age group its Diagnosis, management and Prevention
 - Imaging techniques in Gynecology
- 9) Family Planning & Contraception
- 10) Organizational and operational aspects of National health policies & programs in relation to population and family welfare including Reproductive & Child Health.

XXI. DENTAL DEPARTMENT

XXII .1: CONSERVATIVE DENTISTRY AND ENDODONTICS:

PAPER II (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Clinical significance of Dental Anatomy, Histology, Physiology and Occlusion:
Teeth and Investing tissues (Structure of teeth, Physiology of tooth form, Oral mucosa, Periodontium).
Occlusion (General description, Mechanics of Mandibular motion, Capacity of Motion of the mandible, Articulators and Mandibular movement, Tooth contact during Mandibular movement, Neurologic correlates and Control of Mastication)
2. Dental Caries:
Classification, Lesion, Aetiology, contributory factors, Histopathology of Caries, Epidemiology, Prevention and Control.
3. Diagnosis and Treatment planning:
Pulp Vitality Test, Caries activity test, Different procedures for diagnosing Caries.
4. Preliminary Considerations for Operative Dentistry:
Preoperative Patient and Dental Team considerations (Patient and operator Position, Instrument exchange, Magnification.
Pain Control (Local anaesthesia, analgesia, Hypnosis).
5. Periodontal aspect of Restorative Dentistry:
Preservation of Periodontium, Trauma from occlusion.
6. Cavity preparation:
Classification, Principle of cavity preparation.
7. Restoration (Material and Technique),
Direct Restorative materials (Amalgam, Glass Ionomer, Composites, Direct filling Gold, liners and bases, Pits and Fissure sealants,).

Indirect Restorative Materials (Impression materials, Cast restorative materials, Dental cements).

Interim restoration, Silver amalgam restoration, Glass ionomer restoration, Composite restoration, Cast restoration, Direct gold filling, Dental

Ceramics. Machined Restorations Pins in restorative Dentistry. Bonding.
Finishing and polishing. Colour and its application.

8. Conservative esthetic Procedures:
Conservative alteration of tooth contour and contacts (Alteration of shape of natural teeth, alteration of embrasures, Correction of Diastema).
Conservative treatments for discoloured teeth (Extrinsic and Intrinsic discoloration) Bleaching treatment Microabrasion and Macroabrasion Veneers (Direct and Indirect techniques, Veneer for metal restoration, repair of veneers).
9. Armamentarium and Sterilization.

PAPER III (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Histology and Physiology of Dental Pulp
2. Pulpal and Periapical diseases.
Etiology and Prevention. (Bacterial causes, Traumatic causes, Chemical causes, Idiopathic causes).
Classification.
Diagnosis and treatment planning

3. Common medical findings and Endodontic treatment planning:
Pregnancy, Cardiovascular diseases, Cancer, HIV, End Stage Renal disease, Dialysis, Diabetes, Prosthetic Implant, Behavioural and Psychiatric disorders. etc.
4. Root Canal treatment:
Components of the root canal system.
Root canal anatomy and Anatomy of the apical root. Instruments, Material and devices for root canal therapy.
Access cavity preparation and root canal preparation techniques (Hand instrumentation, rotary, Ultrasonic, laser).
Root canal cleaning technique (irrigants, lubricant, smear layer management, root canal medicaments).
Obturation techniques (types of sealers, Core materials, different methods of obturation).
Restoration of Endodontically treated teeth (Post & core, Coronal coverage).
5. Endodontic mishaps:
Access related (Treating wrong tooth, Missed canals, Damage to existing restoration, Access cavity preparation, Crown Fracture)

Instrumentation related (Ledge formation, Cervical canal perforation, Mid root perforation, Apical perforation, Separated instruments and foreign objects, Canal blockage)
Obturation related (Over or under extended root canal fillings, Nerve paresthesia, Vertical root fractures)
Miscellaneous (Post space perforation, Irrigant related, Tissue emphysema, Instrument aspiration and ingestion)
Detection, Correction and Prevention of Endodontic Mishaps.

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Endodontic microbiology and treatment of infection:
(Pathways of pulpal infection, microbial endodontic infection, extra-radicular endodontic infection, antibiotics and analgesic for Endodontic infection, Prophylactic antibiotics).
2. Dental traumatic Injury and endodontics:
Treatment methods of vital and non-vital tooth.
Crown, root fracture and crown-root fracture.
Luxation injuries, Avulsed tooth and management.
3. Geriatric Endodontics:
4. Paediatric Endodontics:
5. Endodontic failure:
Microbial, Non-microbial causes.
Non surgical retreatment techniques.
6. Surgical Endodontics:
Anatomical and biological perspectives (Systemic consideration, Pharmacological consideration, Anatomy and physiology of Periodontium, Radicular consideration).
Periradicular surgery (Indications, Surgical access, periradicular curettage, root end resection, root end filling).
Fistulative surgery (Incision & Drainage, Cortical Trephination)
Corrective Surgery (Perforation repair, Resection procedure and periodontal management, Intentional Replantation).

XXII.2: ORAL AND MAXILLOFACIAL SURGERY:

PAPER II (TECHNICAL)

Total marks – 200
Duration - 3 hours

Basic Science

1. Surgical anatomy and embryology of –
 - a. Oral cavity
 - b. Eye and nose
 - c. Mandible and maxilla
 - d. Head and neck
- B. Physiology of oral cavity, nose, nasopharynx etc
- C. Human anatomy of head and neck
- D. Human physiology
- E. Biochemistry
- F. Pathology
- G. Microbiology
- H. Pharmacology

PAPER III (TEHCNICAL)

Total marks – 200
Duration - 3 hours

Disease including aetiology, Symptoms, investigations and management

- a. facial palsy
- b. trigeminal neuralgia
- c. benign and malignant diseases of oral cavity
- B. Disease of TMJ and management like arthritis, myalgias etc.
- C. Bone diseases of mandible and maxilla like cyst, osteomyelitis, ameloblastoma, sarcoma, chondrosarcoma, fibro osseous diseases etc
- D. Cleft lip and cleft palate
- E. Fractures of mandibles and maxilla and TMJ ankylosis
- F. Orthognathic surgery
- G. Infections of head and neck regions

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

- H. Radiological investigations
 - a. Intra oral periapical (IOPA)
 - b. Extra oral X-Ray like, PNS, OMV, lateral, PA skull view etc
 - c. OPG
 - d. Different types of computed tomography CT scan and 3D reconstructions
 - e. Cone beam computed tomography
- I. Surgical instruments of oral and maxillofacial surgery
 - a. Different types of extractions forceps including elevators, criers, mallet and chisels
 - b. Cleft lips and palates instruments
 - c. Orthognathic surgical instruments
 - d. Open reduction internal fixation sets
 - e. Implants materials
 - f. Bone grafting instruments
 - g. Different types of plates and screws for ORIF
- J. Sterilization

XXII.3: ORAL MEDICINE, ORAL PATHOLOGY AND ORAL RADIOLOGY:

TECHNICAL PAPER II

Total marks – 200

Duration - 3 hours

(Oral Pathology)

Basics -

- Oral disease –
 - i. Bacterial infection
 - ii. Viral infection
 - iii. Fungal infection
 - iv. Mycotic infection
 - v. Dental caries
- Development disturbances
- Benign and malignant tumours of oral cavity
- Odontogenic cysts and tumors
- Diseases of salivary glands
- Pulp and periapical infection
- Physical and chemical injuries
- Diseases of bones and joints
- Diseases of nerves and muscles
- Skin and vesiculobullous lesions
- Oral aspects of metabolic diseases
- Tongue disorders
- Pigmentation
- Specific systematic disorders
- Diseases of blood
- AIDS
- Endocrine disorders

PAPER III (TECHNICAL)

Total marks – 200

Duration - 3 hours

(Oral Medicine)

- Antibiotics
- Analgesic and Anti-inflammatory drugs
- Anti cancer drugs
- Anti Viral drugs
- Ceticosteroids
- Drugs used in pregnancy
- Desensitizing agents, mouthwashes and gum paints
- Vitamins
- Emergency drugs used in Dentistry
- Antifungal drugs
- Halitosis
- Immunomodulators
- Forensic dentistry

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

(Oral Radiology)

- Radiation physics
- Radiation biology
- Radiation safety and protection
- Quality Assurance in Dental Radiography
- X-Ray film and techniques
- X-Ray film processing
- Normal Radiographic Anatomy
- Extra-Oral Radiography
- Panoramic Radiography
- Specialized Radiographic Techniques
- Infection control in Radiography
- Radiographic interpretation of Dental Caries
- Radiographic interpretation of periodontal diseases
- Radiographic features of jaw cyst, tumour and fibro-osseous lesions
- Infection and inflammation of the jaws
- Radiographic diagnosis

XXII.4: ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS:

PAPER II (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Facial growth and development
2. Histology of dental tissues
3. Development of Occlusion and Etiology of Malocclusions
4. Physiology and Biologic Basis in Orthodontics
5. Psychological development and behavior management in orthodontics
6. Periodontal/orthodontics interrelationship
7. Bioengineering in orthodontics
8. Biomechanics in orthodontics
9. Statistics for orthodontics
10. Computer applications in orthodontics
11. Bonding in orthodontics
12. Extra oral forces in orthodontics

PAPER III (TECHNICAL)

Marks – 300
Duration – 3 hours

1. Diagnosis Aids
2. Diagnosis procedures
3. Diagnostic/Interpretations
4. Diagnosis and treatment plans
5. Preventive orthodontics
6. Interceptive orthodontics
7. Adult orthodontics
8. Retention and relapse
9. Orthodontics aspect of orthognathic surgery
10. Guidance and occlusion

11. Cleft-lip and palate
12. Aesthetic concept

PAPER IV (TECHNICAL)

Total marks – 200
Duration - 3 hours

1. Biomechanics in clinical orthodontics
2. Techniques in fixed mechanics
3. Dentofacial orthopedics with functional appliances
4. Twin-block functional therapy
5. Removable appliances
6. Distraction osteogenesis
7. Impacted canines
8. TMJ disorder and occlusion
9. Inter-disciplinary approach
10. Anchorage
11. Dental implants
12. Routine operative techniques

XXII.5: PEDIATRIC AND PREVENTIVE DENTISTRY SYLLABUS OF DCI (PEDODONTICS):

PAPER II (TECHNICAL)

Total marks – 200
Duration - 3 hours

Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Anatomy of the scalp, temple and face
- Anatomy of the triangles of neck and deep structures of the neck
- Cranial and facial bones and its surrounding soft tissues with its applied aspects
- Muscles of head and neck
- Arterial supply, venous drainage and lymphatics of head and neck
- Congenital abnormalities of the head and neck
- Anatomy of the cranial nerves
- Anatomy of the tongue and its applied aspects
- Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
- Autonomous nervous system of head and neck
- Functional anatomy of mastication, deglutition, speech, respiration and circulation
- TMJ: anatomy and function

Applied Physiology:

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance. Blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, Normal ECG, capillary and lymphatic circulation, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws. Role of Vit. A, C and B complex in oral mucosal and periodontal health. Physiology and function of the masticatory system. Speech mechanism, swallowing and deglutition mechanism, salivary glands and Saliva

Applied Pathology:

Inflammation and chemical mediators, Thrombosis, Embolism, Necrosis, Repair, Degeneration, Shock, Hemorrhage, Blood dyscrasias, Pathogenesis of Dental Caries, Periodontal diseases, tumors, oral mucosal lesions etc. in children

Applied Microbiology:

Microbiology & Immunology as related to Oral Diseases in Children: Basic concepts, immune system in human body, Auto Immune diseases and Immunology of Dental caries.

Applied Nutrition & Dietetics:

- General principles, balanced diet, effect of dietary deficiencies and starvation, protein energy, malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis
- Diet, digestion, absorption, transportation and utilization

Genetics:

- Introduction to genetics
- Cell structure, DNA, RNA, protein synthesis, cell division
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Growth & Development:

Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures. Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth.

PAPER III (TECHNICAL)

Total marks – 200

Duration - 3 hours

Pediatric Dentistry

Child Psychology: Development & Classification of behavior, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear, anxiety, apprehension & its management.

Behavior Management: Non- pharmacological & Pharmacological methods. Child Abuse & Dental Neglect:

Conscious Sedation:

Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children)

Preventive Pedodontics:

Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant & extensive caries – Recognition, Features & Preventive Management, Pit and Fissures Sealants, Oral Hygiene measures, Correlation of brushing with dental caries and periodontal diseases. Diet & Nutrition as related to dental caries. Diet Counseling

Dental Plaque:

Definition, Initiation, Pathogenesis, Biochemistry, and Morphology & Metabolism.

Gingival & Periodontal diseases in Children:

- Normal Gingiva & Periodontium in children.
- Gingival & Periodontal diseases – Etiology, Pathogenesis, Prevention & Management Pediatric Operative Dentistry:
- Principle of Operative Dentistry along with modifications of materials/past, current & latest including tooth colored materials.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative material like Glass Ionomer, Composites, Silver, Amalgam & latest material (gallium)
- Stainless steel, Polycarbonate & Resin Crowns / Veneers & fibre post systems.

Pediatric Endodontics:

- Primary Dentition: - Diagnosis of pulpal diseases and their management – Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
- Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
- Recent advances in Pediatric diagnosis and Endodontics. Prosthetic consideration in Pediatric Dentistry.

Traumatic Injuries in Children:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth with latest concepts.
- Management of jaw fractures in children.

Interceptive Orthodontics:

- Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.
- A comprehensive review of the local and systemic factors in the causation of malocclusion.
- Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).
- Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra cellular consideration in tooth movement.
- Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
- Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
- Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques).
- Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics, Planned extraction in interceptive orthodontics.

Oral Habits in Children:

- Definition, Etiology & Classification
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children

Dental care of Children with special needs:

Definition, Etiology, Classification, Behavioral, Clinical features & Management of children with:

- Physically handicapped conditions
- Mentally compromising conditions
- Medically compromising conditions
- Genetic disorders

Oral manifestations of Systemic Conditions in Children & their Management
 Management of Minor Oral Surgical Procedures in Children
 Dental Radiology as related to Pediatric Dentistry

Cariology:

- Historical background
- Definition, Aetiology & Pathogenesis
- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries. Definition, aetiology,

Pathogenesis, Clinical features, Complications & Management.

- Role of diet and nutrition in Dental Caries
- Dietary modifications & Diet counseling.
- Subjective & objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility & their clinical Applications

Pediatric Oral Medicine & Clinical Pathology: Recognition & Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.

Congenital Abnormalities in Children: Definition, Classification, Clinical features & Management.

Dental Emergencies in Children and their Management. Dental Materials used in Pediatric Dentistry.

TECHNICAL PAPER IV (TECHNICAL)

Total marks – 200
 Duration - 3 hours

Preventive Dentistry:

- Definition
- Principles & Scope
- Types of prevention
- Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.

Dental Health Education & School Dental Health Programmes:

Dental health concepts, Effects of civilization and environment, Dental Health delivery system, Public Health measures related to children along with principles of Pediatric Preventive Dentistry

Fluorides:

- Historical background
- Systemic & Topical fluorides
- Mechanism of action
- Toxicity & Management.
- Defluoridation techniques.

Medico legal aspects in Pediatric Dentistry with emphasis on informed consent. Counseling in Pediatric Dentistry

Case History Recording: Outline of principles of examination, diagnosis & treatment planning.

Epidemiology: Concepts, Methods of recording & evaluation of various oral diseases. Various national & global trends of epidemiology of oral diseases.

Comprehensive Infant Oral Health Care.

Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

Comprehensive cleft care management with emphasis on counseling, feeding, nasoalveolar bone remodeling, speech rehabilitation.

Setting up of Pediatric Dentistry Clinic.

Emerging concepts in Pediatric Dentistry of scope of lasers / minimum invasive procedures in Pediatric Dentistry.

XXII.6 : PERIODONTICS & ORAL IMPLANTOLOGY

TECHNICAL PAPER II: (Biologic Basis of Periodontology)

Total marks – 200

Duration - 3 hours

Section 1 - Normal Periodontium

Anatomy of the periodontium

Aging and the periodontium

Section 2 - Classification and Epidemiology of Periodontal Diseases Classification of diseases and conditions affecting the periodontium Fundamentals in the methods of periodontal disease epidemiology

Section 3 - Etiology of Periodontal Diseases

Periodontal pathogenesis

Genetic susceptibility to periodontal disease

The role of dental calculus and other local predisposing factors

Biofilm and periodontal microbiology

Molecular biology of the host-microbe interactions in periodontal diseases

Smoking and periodontal disease

Section 4 - Relationship between Periodontal Disease and Systemic Health

Influence of systemic conditions on the periodontium

Impact of periodontal infection on systemic health

Section 5 - Gingival Pathology

Defense mechanisms of the gingiva

Gingival inflammation Vs Gingival enlargement

Acute gingival infections

Desquamative gingivitis

Section 6 - Periodontal Pathology

The periodontal pocket

Bone loss and patterns of bone destruction

Chronic periodontitis vs Aggressive periodontitis

Pathology and management of periodontal problems in patients with HIV infection

PAPER III (TECHNICAL) : (Clinical Periodontics)

Total marks – 200

Duration - 3 hours

Section 1 - Diagnosis, Prognosis, and Treatment Plan

Radiographic aids in the diagnosis of periodontal disease

Determination of prognosis
 Rationale for periodontal treatment
 Periodontal treatment of medically compromised patients

Section 3 - Non-surgical Treatment --Phase I: Periodontal therapy
 Plaque biofilm control for the periodontal patient
 Scaling and root planning
 Sonic and ultrasonic instrumentation and irrigation Locally delivered drugs & Host modulation therapy

Section 5 - Surgical Treatment
 Gingival surgical techniques
 The flap techniques for pocket therapy Resective osseous surgery
 Periodontal regeneration and reconstructive surgery Furcation involvement and treatment
 Periodontal plastic and esthetic surgery Periodontal microsurgery
 Recent advances in surgical therapy: Lasers in periodontal therapy Multidisciplinary approach to dental and periodontal problem Supportive periodontal treatment

PAPER IV (TECHNICAL): (Oral Implantology)

Total marks – 200
 Duration - 3 hours

Section 1 - Biology, Diagnosis, Biomechanics, and Treatment Plan
 Periimplant anatomy, biology and function
 Clinical evaluation of the implant patient
 Diagnostic imaging for the implant patient
 Biomechanics, prosthetic considerations, and treatment planning

Section 2 - Surgical Procedures
 Basic implant surgical procedures & their complications
 Localized bone augmentation and implant site development
 Advanced implant surgical procedures
 Esthetic management of difficult cases (minimally invasive approach)

Section 3 - Supportive Care and Results of Implant Treatment
 Supportive implant treatment
 Results of implant treatment
 Introduction to evidence-based decision-making Electronic dental records and decision support systems

XXII.7: PROSTHODONTICS, CROWN AND BRIDGE AND DENTAL MATERIAL SCIENCE

TECHNICAL PAPER II (TECHNICAL) -(BASIC SCIENCE):

Total marks – 200
 Duration - 3 hours

APPLIED ANATOMY

1. Muscles of facial expression and muscles of mastication
2. Temporomandibular joint
3. Salivary glands
4. Biology and anatomy of dental tissues (enamel, dentin, cementum, pulp and periodontium)
5. Oral Cavity and vestibule
6. Tongue
7. Palate
8. Mandible and maxilla

B. EMBRYOLOGY

1. Development of face, palate, mandible and maxilla
2. Development of tooth

C. HISTOLOGY

1. Study of epithelium of oral cavity
2. Bone and tooth
3. Tongue
4. Salivary glands

D. PHYSIOLOGY

1. Physiology and function of the masticatory system
 2. Blood coagulation mechanisms
 3. Blood groups
 4. RBC and haemoglobin
 5. WBC Function and classification
 6. Cardiac cycle
 7. Regulation of blood pressure
 8. Shock, hypertension, cardiac failure
 9. Composition function and regulation of saliva
 10. Mastication and deglutition
 11. Endocrine system
 - a) Pituitary hormone
 - b) Thyroid hormone
 - c) Parathyroid hormone
 12. Gerodontics
- A. Nutrition in geriatric patients
- B. Consequences and management of age changes

E. BIOCHEMISTRY

1. Carbohydrates
 - a) Digestion of starch and absorption of glucose
 - b) Metabolism of glucose, specifically glycolysis, TCA
 - c) Blood sugar regulation
2. Lipids – Essential and non-essential fatty acids
3. Proteins – Essential and non-essential amino acids
4. Minerals
 - a) Calcium and Phosphorous metabolism
 - b) Iron Metabolism
 - c) Trace elements in nutrition
5. Vitamins – Vitamin A,B (All types) C,D & E

F. PATHOLOGY

1. Inflammation
 - a) Repair and regeneration, necrosis and gangrene
 - b) Roll of complement system in acute inflammation
 - c) Roll of Arachidonic acid and its metabolites in acute inflammation
 - d) Pulpitis and periodontitis

2. Shock
 - a) Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
 - b) Circulatory disturbances.
 - c) Ischaemic hyperemia
 - d) Venous congestion
 - e) Edema
 - f) Infarction
3. Hypersensitivity
 - a) Anaphylaxis.
 - b) Type 2 hypersensitivity,
 - c) Type 3 hypersensitivity
 - d) Cell mediated reaction and its clinical importance.
 - e) System lupus erythematosus
 - f) Infection and infective granulomas
4. Neoplasia
 - a) Classification of tumors
 - b) Carcinogenesis and carcinogen – chemical, viral and microbial
 - c) Grading and staging of cancers, tumor, Angiogenesis, Paraneoplastic syndrome.
 - d) Spread of tumors
 - e) Characteristics of benign and malignant tumors
5. Others
 - a) AIDS
 - b) Hepatitis B
6. CYSTS- Classification, types (esp. Dental, dentigerous)
7. Pathology of oral soft and hard tissues
8. Dental plaque
9. Dental caries
10. Attrition, Abrasion and erosion of teeth
11. Oral Manifestations of systemic diseases

G. MICROBIOLOGY

1. Applied General Microbiology
 - a) Gram positive bacteria
 - b) Gram negative bacteria
 - c) Aerobes and anaerobes
 - d) Microbiology of tuberculosis
2. Oral Microbiology – normal oral flora
3. Sterilization and disinfection
4. Microbiology of pulpal and periodontal diseases

H. PHARMACOLOGY

1. General and local anesthetics, hypnotics, anti-epileptics and tranquilizers
2. Chemotherapeutics and antibiotics
3. Analgesics, antipyretics and NSAID
4. Antiseptics, sialogogues and anti sialogogues
5. Haematinics
6. Anti-diabetics
7. Vitamins A, B complex, C,D,E,K and trace elements
8. Steroids

9. Dentifrices
10. Desensitizing agents
11. Fluorides

TECHNICAL PAPER III (TECHNICAL) : DENTAL MATERIAL SCIENCE/INSTRUMENTS AND X-RAY

Total marks – 200
Duration - 3 hours

1. Overview of materials for dental applications with special reference to standards for dental materials
2. Biocompatibility of Dental Materials
3. Structure of matter and principles of adhesion
4. Physical properties of Dental Materials
5. Mechanical Properties of Dental materials
6. Solidification and microstructure of Metals
7. Equilibrium phases in cast alloys
8. Dental Polymers
9. Impression Material
10. Gypsum Products
11. Dental Waxes
12. Casting Investments and procedures
13. Finishing and Polishing materials with special reference to bur design
14. Bonding for direct restorative materials
15. Restorative resins
16. Dental cements
17. Dental Casting and soldering alloys
18. Wrought alloys except orthodontic wires and brackets
19. Dental Ceramics
20. Denture base resins
21. Dental Implants
22. Materials for maxillofacial prosthetics
23. Materials for post and core

Instruments

- (1) All instruments concerning prosthodontics

Radiological Investigations

- (1) IOPA (Intra oral periapical) X-Ray
- (2) Extra oral X-Ray - PNS, OMV, PA skull
- (3) Orthopantograph (OPG) X-Ray
- (4) Different types of computed tomography CT Scan
- (5) MRI
- (6) Recent advances in dentistry

TECHNICAL PAPER IV: TYPES OF PROSTHESES

Total marks – 200
Duration - 3 hours

1. REMOVABLE PROSTHODONTICS
 - (a) Complete Denture Prosthodontics
 - (b) Removable Partial Denture Prosthodontics

2. FIXED PARTIAL PROSTHODONTICS
3. IMPLANT SUPPORTED PROSTHODONTICS
4. MAXILLOFACIAL PROSTHODONTICS
5. MISCELLANEOUS
 - (a) Full mount rehabilitation
 - (b) Over dentures
 - (i) Tooth supported over dentures
 - (ii) Implant supported over dentures
 - (c) Immediate dentures
 - (d) Single complete denture
 - (e) Pre-prosthetic surgery

XXII.8: PUBLIC HEALTH DENTISTRY

PAPER-II (TECHNICAL)

Total marks – 200

Duration - 3 hours

Applied Anatomy in relation to:

Development of face
Bronchial arches

Muscles of facial expression
Muscles of mastication

TMJ

Salivary gland

Tongue
Salivary

gland
Tongue

Hard and soft palate

Infratemporal fossa
Para nasal air sinuses
Pharynx and larynx

Cranial and spinal nerves-with emphasis on trigeminal, facial, glossopharyngeal and hypoglossal nerve

Osteology of maxilla and mandible

Blood supply, venous and lymphatic drainage of head and neck
Lymph nodes of head and neck

Structure and relations of alveolar process and edentulous mouth
Genetics –fundamentals

A Oral Histology

Development of dentition, innervations of dentin and pulp

Periodontium-development, histology, blood supply and lymphatic drainage
Oral mucous membrane

Pulp –periodontal complex

APPLIED PHYSIOLOGY AND BIOCHEMISTRY:

Cell

Mastication and deglutition
Food and nutrition

Metabolism of carbohydrates, proteins and fats
Vitamins and minerals

Fluid and electrolyte balance

Pain pathway and mechanism –types, properties

Blood composition and functions, clotting mechanism and erythropoiesis, blood groups and transfusions,
pulse and blood pressure,

Dynamics of blood flow

Cardiovascular homeostasis –heart sounds

Respiratory system: Normal physiology and variations in health and diseases,

Asphyxia and artificial respiration

Endocrinology: thyroid, parathyroid glands, pituitary, sex hormones and pregnancy, Endocrine

Regulation of blood sugar.

APPLIED PATHOLOGY:

Pathogenic mechanism of molecular level Cellular changes following injury Inflammation and chemical mediators Oedema, thrombosis and embolism Hemorrhage and shock
Neoplasia and metastasis Blood disorders
Histopathology and pathogenesis of dental caries, periodontal disease, oral mucosal lesions, and malignancies, HIV Propagation of dental infection

B MICROBIOLOGY:

Microbial flora of oral cavity
Bacteriology of dental caries and periodontal disease Methods of sterilization
Virology of HIV, herpes, hepatitis Parasitology
Basic immunology –basic concepts of immune system in human body cellular and hum oral immunity antigen and antibody system Hypersensitivity Autoimmune diseases

C ORAL PATHOLOGY

Detailed description of diseases affecting the oral mucosa, teeth, supporting tissues and jaws

PHYSICAL AND SOCIAL ANTHROPOLOGY:

Introduction and definition
Appreciation of the biological basis of health and disease
Evolution of human race, various studies of different races by anthropological methods

APPLIED PHARMACOLOGY:

Definition scope and relations to other branches of medicine, mode of action, bioassay, standardization, pharmacodynamics, pharmacokinetics.
Chemotherapy of bacterial infections and viral infections –sulphonamides and antibiotics
Local anesthesia
Analgesics and anti –inflammatory drugs
Hypnotics, tranquilizers and antipyretics
Important, hormones –ACTH, cortisone, insulin and oral antidiabetics. Drug addiction and tolerance
Important pharmacological agents in connection with autonomic nervous system – adrenaline, noradrenalin atropine
Brief mention of antihypertensive drugs Emergency drugs in dental practice Vitamins and haemopoietic drugs

RESEARCH METHODOLOGY AND BIOSTATISTICS:

HEALTH INFORMATICS –basic understanding of computers and its components, operating software (windows), Microsoft office, preparation of teaching materials like slides, project, multimedia knowledge.

RESEARCH METHODOLOGY –definitions, types of research, designing written protocol for research, objectivity, in methodology, quantification, records and analysis.

BIOSTATISTICS –introduction, applications, uses and limitations of bio –statistics in public Health Dentistry, collection of data, presentation of data, measures of central tendency, measures of dispersion methods of summarizing, parametric and non parametric tests of significance, correlation and regression, multivariate analysis, sampling and sampling techniques –types, errors, bias, trial and calibration.

COMPUTERS -basic operative skills in analysis of data and knowledge of multimedia.

PAPER-III (TECHNICAL)

Total marks – 200
Duration - 3 hours

A. Public Health

Definition concepts and philosophy of dental health History of public health in and at international level Terminologies used in public health

HEALTH:

Definition , concepts and philosophy of health indicators
Community and its characteristics and relation to health

DISEASE:

Definition, concepts
Multifactorial causation, natural history, risk factors
Disease control and eradication, evaluation and causation, infection of specific diseases
Vaccines and immunization

B. GENERAL EPIDEMIOLOGY

Definition and aims, general principles Multifactorial causation, natural history, risk factors
Methods in epidemiology, descriptive analytical, experimental and classic epidemiology of specific diseases, uses of epidemiology Duties of epidemiologist
General idea of method of investigating chronic diseases, mostly non –infectious nature, epidemic, endemic, and pandemic.
Ethical conversation in any study requirement New knowledge regarding ethical subjects
Screening of diseases and standard procedures used

C. ENVIRONMENTAL HEALTH:

Impact of important components of the environment of health
Principles and methods of identification, evaluation and control of such health hazards
Pollution of air, water soil, noise, food
Water purification, international standards of water
Domestic and industrial toxins, ionizing radiation
Occupational hazards
Waster disposal –various methods and sanitation

PUBLIC HEALTH EDUCATION:

Definition, aims, principles of health education
Health education, methods, models, contents ,planning health education programs

PUBLIC HEALTH PRACTICE AND ADMINISTRATION SYSTEM IN INDIA.

ETHICS AND JURISPRUDENCE:

Basic principles of law

Contract laws-dentist –patient relationships & legal forms of practice Dental malpractice
Person identification through dentistry Legal protection for practicing dentist Consumer protection Act

NUTRITION IN PUBLIC HEALTH:

Study of science of nutrition and its application to human problem Nutritional surveys and their evaluations
Influence of nutrition and diet on general health and oral health, dental caries, periodontal disease and oral cancers

Dietary constituents and carcinogenicity
Guidelines for nutrition

BEHAVIORAL SCIENCES:

Definition and introduction

Sociology: social class, social group, family types, communities and social relationships, culture, its effect on oral health

Psychology: definition, development of child psychology, anxiety, fear and phobia, intelligence, learning, motivation, personalities, fear, dentist-patient relationship modeling and experience

HOSPITAL ADMINISTRATION:

Departmental maintenance, organizational structures Types of practices

Biomedical waste management

HEALTH CARE DELIVERY SYSTEM:

International oral health care delivery systems-Review

Central and state system in general and oral health care delivery system if any National and health policy

National health programme

Primary health care-concepts, oral health in PHC and its implications National and international health organizations

Dentists Act 1928, dental council of India, ethics, Indian dental association Role of W.H.O. and Voluntary organizations in Health Care for the community

ORAL BIOLOGY AND GENETICS:

A detailed study of cell structure

Introduction to Genetics, Gene structure, DNA, RNA Genetic counseling, gene typing

Genetic approaches in the study of oral disorders Genetic Engineering –Answer to current health problems

PAPER-III –Dental Public Health

Dental Public Health History

Definition and concepts of dental public health Differences between clinical and community dentistry

Critical review of current practice

Dental problems of specific population groups such as chronically ill, handicapped and institutionalized group.

TECHNICAL PAPER IV (TECHNICAL)

Total marks – 200

Duration - 3 hours

EPIDEMIOLOGY OF ORAL DISEASES AND CONDITIONS:

Dental caries, gingival, periodontal disease malocclusion, dental Fluorosis, oral cancer, TMJ disorders and other oral health related problems.

ORAL SURVEY PROCEDURES:

Planning Implementation

WHO basic oral health methods 1997 Indices for dental diseases and conditions Evaluation

DELIVERY OF DENTAL CARE:

Dental personpower –dental auxiliaries Dentist – population ratios,

Public dental care programs

School dental health programs –Incremental and comprehensive care Private practice and group practice

Oral health policy –National and international policy

PAYMENT FOR DENTAL CARE:

Prepayment Post –
payment
Reimbursement plans
Voluntary agencies
Health insurance

EVALUATION OF QUALITY OF DENTAL CARE:

Problems in public and private oral health care system program Evaluation of quality of services, governmental control

PREVENTIVE DENTISTRY:

Levels of prevention
Preventive oral health programs screening, health education and motivation Prevention of all dental diseases –dental caries, periodontal diseases, oral cancer, malocclusion and Dentofacial anomalies
Role of dentist in prevention of oral diseases at individual and community level. Fluoride
History
Mechanism of action
Metabolism
Fluoride toxicity Fluorosis
Systemic and topical preparations Advantages and disadvantages of each Update regarding Fluorosis
Epidemiological studies
Methods of fluoride supplements Defluoridation techniques Plaque control measures
Health Education Personal oral hygiene Tooth brushing technique Dentifrices, mouth rinses
Pit and fissure sealant, ART
Preventive oral health care for medically compromised individual Update on recent preventive modalities
Caries vaccines
Dietary counseling

PRACTICE MANAGEMENT:

Definition
Principles of management of dental practice and types
Organization and administration of dental practice Ethical and legal issues in dental practice Current trends