



BMLT

1st Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT101	Human Anatomy and Physiology-I (Theory)	40	60	100
BMLT102	Pathology-I (Theory)	40	60	100
BMLT103	General Microbiology-1 (Theory)	40	60	100
BMLT104	Biochemistry-1 (Theory)	40	60	100
BMLT105	Communication for Professionals (Theory)	40	60	100
LAB/PRACTICAL				
BMLT106	Human Anatomy and Physiology-I (Practical)	60	40	100
BMLT107	Pathology-I (Practical)	60	40	100
BMLT108	General Microbiology-I (Practical)	60	40	100
BMLT109	Biochemistry-I(Practical)	60	40	100
Total		440	460	900

2nd Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT201	Human Anatomy and Physiology-II (Theory)	40	60	100
BMLT202	Pathology-II (Theory)	40	60	100
BMLT203	General Microbiology-2 (Theory)	40	60	100
BMLT204	Biochemistry-2 (Theory)	40	60	100
BMLT205	Fundamentals of Computer Science (Theory)	40	60	100
LAB/PRACTICAL				
BMLT206	Human Anatomy and Physiology-II (Practical)	60	40	100
BMLT207	Pathology-II (Practical)	60	40	100
BMLT208	General Microbiology-II (Practical)	60	40	100
BMLT209	Biochemistry-II(Practical)	60	40	100
Total		440	460	900

3rd Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT301	Hematology and Blood Banking-I (Theory)	40	60	100
BMLT302	Clinical Biochemistry-I (Theory)	40	60	100
BMLT303	Basic and Clinical Pharmacology (Theory)	40	60	100
BMLT304	Health education and health communication (Theory)	40	60	100
BMLT305	Biomedical Waste Management (Theory)	40	60	100
LAB/PRACTICAL				
BMLT306	Hematology and Blood Banking-I(Practical)	60	40	100
BMLT307	Clinical Biochemistry-I (Practical)	60	40	100
Total		320	380	700

4th Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT401	Hematology and Blood Banking-II (Theory)	40	60	100
BMLT402	Clinical Biochemistry-II (Theory)	40	60	100
BMLT403	Bacteriology, Immunology and Parasitology (Theory)	40	60	100
BMLT404	Community Medicine (Theory)	40	60	100
LAB/PRACTICAL				
BMLT405	Hematology and Blood Banking-II (Practical)	60	40	100
BMLT406	Clinical Biochemistry-II (Practical)	60	40	100
BMLT407	Bacteriology, Immunology and Parasitology (Practical)	60	40	100
Total		320	380	700

5th Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT501	Virology, Mycology and Applied Microbiology (Theory)	40	60	100
BMLT502	Histopathology and Cytopathology Techniques (Theory)	40	60	100
BMLT503	Histotechnology (Theory)	40	60	100
BMLT504	Clinical enzymology and automation (Theory)	40	60	100
LAB/PRACTICAL				
BMLT505	Virology, Mycology and Applied Microbiology (Practical)	60	40	100
BMLT506	Histopathology and Cytopathology Techniques (Practical)	60	40	100
Total		280	320	600

6th Semester

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
BMLT601	Diagnostic Molecular Biology (Theory)	40	60	100
BMLT602	Essentials of Medical Pharmacology (Theory)	40	60	100
BMLT603	Biomedical Techniques, Lab Management and Ethics (Theory)	40	60	100
LAB/PRACTICAL				
BMLT604	Diagnostic Molecular Biology (Practical)	60	40	100
BMLT605	Hospital Training	60	40	100
Total		240	260	500

SEMESTER I

BMLT 101: HUMAN ANATOMY AND PHYSIOLOGY-I (THEORY) 45 Hours

Course Content

Unit -1

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsalcavity, Ventral cavity, Planes and Sections

Unit –II

Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division. Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue. The Integumentary System: structure and function of The Skin, Subcutaneous Tissue

Unit-III

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

Unit-IV

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation. Lymphatic system-Composition & function of lymph, lymphatic tissue, Immunity with the role of thymus

Unit-V

Musculoskeletal System: Basic anatomy of important muscles and bones, Structure of skeletal muscle. Muscle contraction and relaxation.

Unit-VI

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock

Unit-VII

Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnoea, cyanosis, asphyxia and obstructive airways diseases

BML 106: HUMAN ANATOMY AND PHYSIOLOGY-I (Practical) 3 Hours/week

1. Demonstration of Major organs through models and permanent slides.
2. Demonstration of parts of circulatory system from models.
3. Demonstration of parts of the respiratory system from models.
4. Demonstration of structural differences between skeletal, smooth and cardiac muscles.
5. Demonstration of various bones
6. Demonstration of various joints
7. To measure pulse rate
8. To measure blood pressure
9. Demonstration of ECG
10. To perform Hemoglobin by Sahli's Method
11. To perform Hemoglobin by CMG method.

Recommended Books (Latest Editions)

BML 102: PATHOLOGY I (Theory) 45 Hours

Course content

Unit I

Introduction & History of pathology, Basic definitions and familiarization with the common terms used in pathology, Causes and mechanisms of cell injury, reversible and irreversible injury, Introduction of hyperplasia, hypoplasia, hypertrophy, atrophy, metaplasia, necrosis and apoptosis

Unit II

General features of acute and chronic inflammation: Vascular changes, cellular events, Cells and mediators of inflammation, Phagocytosis and its mechanism

Unit III

Tissue Renewal and Repair, healing and fibrosis, cirrhosis, introduction of oedema, hyperaemia, congestion, haemorrhage, haemostasis, thrombosis, embolism, infarction, shock and hypertension.

Unit IV

Protein-energy malnutrition, deficiency diseases of vitamins and minerals, nutritional excess and imbalances. Role and effect of metals (Zinc, Iron and Calcium) and their deficiency diseases, Aetiology and pathophysiology of diabetes, arteriosclerosis, myocardial infarction, respiratory diseases (COPD), Parkinson disease, Infectious Diseases: pathogenesis & overview of modes of infections, prevention and control with suitable examples like Typhoid, Dengue

Unit V

Cancer: Definitions, nomenclature, characteristics of benign and malignant neoplasm, metastasis, Carcinogens and cancer, concept of oncogenes, tumour suppressor genes, DNA repair genes and cancers stem cells.

BML 107: PATHOLOGY-I (Practical) 3 Hours/week

1. Haemoglobin by CMG method.
2. To perform Total RBC count t.
3. To perform total leucocyte count.
4. To perform differential leucocyte count.
5. To perform PCV
6. To calculate Red cell indices.
7. To perform total platelet count.
8. To perform bleeding time.
9. To perform clotting time.
10. To study about CSF examination.
11. Microscopic examination of urine
12. Examination of urine
13. Examination of sputum

Recommended Books (Latest Editions)

BMLT 103: GENERAL MICROBIOLOGY-I (Theory) 45 Hours

Course content

Unit-I

Development of microbiology as a discipline, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming, Edward Jenner, Introduction to bacterial taxonomy, Classification of Bacteria, Morphology based on size, shape, arrangement, motility, flagella, spores, capsules, cell wall, plasma membrane, pili, and ribosomes.

Unit-II

Microscopy: Study of compound microscope – magnification, numerical aperture, resolution and components of microscope. Dark ground illumination, care of microscope and common difficulties micrometry. Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluorescence Microscope, Transmission Electron Microscope, Scanning Electron Microscope

Unit-III

Cell size, shape and arrangement, cell-wall, composition and detailed structure of Gram positive and Gram-negative cell walls, Cell Membrane: Structure, function and chemical composition of bacterial cell membranes. Cytoplasm: Ribosome, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids, Endospore: Structure, formation

Unit-IV

General safety measures used in Microbiology laboratory, Sterilization and disinfection: Various physical methods of sterilization – heat, UV radiation, ionizing radiation, filtration, characters affecting sterilization, auto clave control and sterilization indicators. Biomedical waste management in a Medical Microbiology laboratory: Types of the waste generated, Segregation, Treatment, Disposal

Unit-V

Antiseptics & Disinfectants: Definition, types and properties, mode of action, use, qualities of good disinfectants. Chemical disinfectants – phenol and its compounds, alcohol, halogen, heavy metals and quaternary ammonium compounds, aldehyde, gaseous compound. use and abuse of disinfectants. Precautions while using the disinfectants.

BMLT 108: GENERAL MICROBIOLOGY-I (Practical) 3 Hours/week

1. Demonstration of Autoclave and sterilization of media
2. Demonstration of Laminar airflow and mediapreparation
3. Preparation of culture plates
4. Demonstration of Centrifuge.
5. Demonstration of hot air Oven and sterilization of glassware
6. Demonstration of Incubator and preservation of cultures
7. Preparation of media
8. Antibiotic sensitivity test.

Recommended Books (Latest Editions)

BMLT 104: BIOCHEMISTRY-1 (Theory) 45 Hours

Course content

Unit-I

Carbohydrates – Definition, Source, Classification, Functions and Importance, Physiological importance of major types of carbohydrates. Carbohydrate metabolism – Glycolysis, HMP shunt, TCA cycle, Glycogenesis, Glycogenolysis, Neo glucogenesis, Blood sugar level

Unit-II

Protein – Definition, Source, Classification, Function and Importance of major type of proteins. Protein metabolism – Transamination, Transmethylation, Deamylation, Urea synthesis, Inborn error of metabolism.

Unit-III

Lipids - Definition, Source, Classification, Function of major type of lipids. Saturated and Unsaturated type of fatty acids, Essential fatty acids and their importance. Phospholipids and their importance. Lipid metabolism – Fatty acid oxidation, Ketone bodies, Metabolism of cholesterol, Arteriosclerosis and Obesity.

Unit-IV

Enzymes: Definition, Classification of enzyme, Cofactor & Coenzymes, Concept of active sites and general mode of action of enzymes, units for measuring enzyme activity, factor affecting enzyme activity, factor responsible for abnormal enzyme secretion

Unit-V

Nucleic acids: Structure, Function and types of DNA and RNA, Nucleotides, Nucleosides, Nitrogen bases, purines and pyrimidines and role of Nucleic acid.

Unit-VI

Vitamins: classification, function and disease associated with vitamins. Minerals and ions: Requirement, function and biological importance of Calcium, Iron, Iodine, Zinc, Phosphorus, Copper, Sodium and Potassium

BML 194: BIOCHEMISTRY-I (Practical) 3 Hours/week

1. To determine protein by Biuret method.
2. To perform protein test by various methods.
3. Physical examination of urine
4. Urine sugar determination by Benedict's method.
5. Protein by heat and acetic method
6. Bile salt, Bile pigments and Urobilinogen determination
7. Determination of Ketone bodies
8. Determination of various parameters of urine by uristick method.
9. Preparation of hemolysate
10. To identify carbohydrates in given solution by various methods.

Recommended Books (Latest Editions)

BMLT 105: COMMUNICATION FOR PROFESSIONALS (Theory) 45 Hours

Course content

1. Introduction: Meaning of Communication; Role of Communication in Business; Basic elements of the Communication process, level of Communication, forms, models and media of Communications, Verbal and non-verbal Communication-functions and types.

Barriers to Effective Communication.

2. Grammar: Subject-verb agreement, tense, voice, improvement of sentences, rearrangement of sentences. Vocabulary: usage, synonyms, antonyms.

3. Comprehension

4. Forms of Writing: The Essay, The Précis, The Report, The Proposal, The C.V. and job

5. Application letter. The Presentation.

6. Role Playing

7. Group Discussion

Recommended Books (Latest Editions)

SEMESTER II

BMLT 201: HUMAN ANATOMY AND PHYSIOLOGY-II (THEORY) 45 Hours

Course content

Unit-I

Digestive system: basic anatomy of the esophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas

Unit-II

Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis

Unit-III

Endocrine system: Different hormones in endocrine system. Action of pituitary, thyroid, parathyroid, adrenal and gonadal hormones. Body temperature regulatory process in human - role of endocrine and nervous system.

Unit-IV

Neurophysiology: Reflex system, automatic nervous system, parts of brain and function of each part. Nerve tract and their role.

Unit-V

Special senses: Structure of retina, rhodopsin and iodopsin cycle, visual tract, accommodation. Auditory tract, mechanism of audition. Structure of taste bud, taste pathway, Olfaction and its physiology.

Unit-VI

Renal physiology: Structure and function of renal system. Urine formation, micturition, renal clearance test, renal buffer system.

Unit-VII

Reproductive system: Male and female reproductive organs, Gametogenesis, Ovulation, Menstrual Cycle.

BMLT 206 HUMAN ANATOMY & PHYSIOLOGY-II (Practical)

3 Hours/week

1. Demonstration of digestive system from models.
2. Demonstration of excretory system from models.
3. Demonstration of nervous system from models.
4. Structure of eye and ear
5. Demonstration of various parts of male & female reproductive system from models

BMLT202: PATHOLOGY-II (THEORY) 45 Hours

Course content

Unit- I

Hemoglobin, structure, function and types, Hemoglobinometry, Haemoglobin estimation by various methods, advantages and disadvantages, physiological and pathological variations on blood parameters, Hemocytometry, visual and electronic method, Neubauer counting chamber, RBC count, WBC count, Platelets count, absolute eosinophil count, principle, procedure, calculation, significance, precautions involved during counting, absolute count of various WBCs. Physiological and pathological changes in values, Erythrocyte sedimentation rate, manual and automated method, factor affecting ESR, packed cell volume, red cell indices (MCV, MCH, MCHC), Physiological and pathological variations in value

Unit-II

Complete blood count, determination by automated method and significance of each parameter, Reticulocyte count, routine examination of CSF, semen, sputum and stool.

Unit –III

Mechanism of coagulation, coagulation factors, Bleeding time, clotting time, platelet count, protamine sulphate test, clot retraction test

Unit-IV

Introduction to immuno hematology and blood banking technology, antigen, antibody, complements, ABO & Rh blood group system, method of determination, other blood group system, Donor selection, blood collection, anticoagulants, additive systems, blood bags, its labelling, storage and transportation

Unit- V

Uses, care & maintenance and calibration of Coulter counter, coagulometer, automatic ESR analyzer, urine analyzer, point of care testing. Pre and Post analytical variables, automation in hematology

BMLT- 207 PATHOLOGY-II (LAB) 3Hours/Week

1. To perform ELISA test. To perform TB IgG & IgM test
2. To perform Dengue IgG & IgM test
3. To demonstrate agglutination reaction.
4. To perform RA test
5. To perform WIDAL test
6. To study about intrauterine contraceptive devices.
7. To demonstrate microscopic structure of bones with permanent slides.
8. To demonstrate the microscopic structure of muscles with permanent slides.

BMLT 203: GENERAL MICROBIOLOGY-II (THEORY) 45Hours

Course content

Unit-I

Lab organization, management, recording of results and quality control in Medical Microbiology Lab. Safety measures in Microbiology Laboratory, Occurrence of lab infections, route of infections in laboratory, safety measures precaution in use of pathogens in teaching.

Unit-II

Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Carriers and their types, Opportunistic infections, Nosocomial infections. Transmission of infection

Unit-III

Principle, working, use, care & maintenance of Laminar air flow, Centrifuge, Autoclave, hot air Oven, Incubator, Colony Counter, Muffle Furnace, Mac-intos Fieldjaretc. Sterility testing of fl/fluids, Collection, transportation and processing of fl/v fluids for bacterial contamination, Recording the result and interpretation

Unit-IV

Hospital acquired infection, Specimen collection from patients, clinics and hospitals, Specimen collection for epidemiological investigations, role of microbiology laboratory in control of nosocomial infection
Antimicrobial agents and Antibiotics: Introduction, mechanism of action, classification and uses, Antibiotic susceptibility testing in bacteriology, Culture medium used for Antibiotic susceptibility testing, Preparation and standardization of inoculums, Control bacterial strains, Description, morphology, cultural characteristics, pathogenicity, cultural characteristics, clinical features and lab diagnosis of Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Bordetella, Choice of antibiotics MIC and MBC: Concepts and methods for determination. Various methods of Antibiotic susceptibility testing with special reference to Stokes and Kirby-Bauer method

Unit-V

Description, morphology, cultural characteristics, pathogenicity, cultural characteristics, clinical features and lab diagnosis of Clostridia, Escherichia coli, Salmonella, Shigella, Proteus, Vibrio, Pseudomonas, Spirocheates, Chlamydia, Actinomyces, Rickettsia, Yersenia, Brucella, Description, morphology, cultural characteristics, pathogenicity, cultural characteristics, clinical features and lab diagnosis of Vibrio, Pseudomonas, Spirocheates, Chlamydia, Actinomyces, Rickettsia, Yersenia, Brucella, Introduction of Mycology: Definition, general properties and classification Cutaneous mycoses, Systemic mycoses, Opportunistic mycoses Culture and laboratory test for fungus.

BMLT 208: GENERAL MICROBIOLOGY-II (Practical) 3Hours/Week

1. To perform HIV Tridot test.

2. To perform radial immune-diffusion test.
3. To perform immune-precipitation method.
4. To perform HBsAg rapid test.
5. To perform ASO test
6. Introduction of Allergy panel
7. Mantoux test
8. Grossing of tissue
9. To perform tissue processing by manual method.
10. To perform section cutting of paraffin embedded tissue.
11. To fix the smear on glass slide.
12. To perform hematoxylin and eosin staining.
13. To perform PAS staining.
14. To perform AFB staining.

BML- 204 BIOCHEMISTRY-I (THEORY) 45 HOURS

Course Content

Unit-I

Introduction to Clinical Biochemistry and role of Medical Lab Technologist, ethics, responsibility, safety measure and hazards in clinical biochemistry lab and first aid in laboratory accidents.

Glassware's & plastic ware's used in lab, calibration of volumetric apparatus, cleaning & care and maintenance

Unit II

Principle, working, care & maintenance and calibration of Weighing balance, Hotplate, Magnetic stirrer, Centrifuges, Incubator, Hot air oven, Colorimeter, Spectrophotometer, Water distillation plant, Deionizers Henderson Hasselbalch equation, pH paper, pH meter, method of pH measurement

Unit-III

Preparation of solution and reagents, normal solution, molar solutions, percent solution, buffer solution, dilutions, w/v, v/v, standard solution, aqueous solutions, concepts of acid and base

Units of measurement: SI unit, reference range, conversion factor, units for measurement of bio metabolite, enzymes, protein, drugs, hormones, vitamins

Unit-IV

Specimen collection and processing of blood, urine & CSF, separation of serum and plasma, deproteinization of sample, Handling of specimens for testing, preservation of specimen, transport of specimen, factors affecting the clinical results, effect of storage on sample

Unit- V

Physical, chemical and microscopic examination of urine, Bence Jones Proteinuria and its clinical significance, qualitative test of urine for reducing sugars, protein, ketone bodies, bile Salt, bile pigments, urobilinogen, occult blood, uric acid, urea and Creatinine, quantitative estimation of 24 hrs urine for protein and their clinical significance.

BMLT- 209 BIOCHEMISTRY-II (LAB) 3 Hours/Week

1. To study general laboratory sssssssssss.
2. To demonstrate glassware, apparatus and plastic ware used in laboratory
3. Collection of blood sample
4. To separate serum and plasma.
5. Preparation of different percentage solutions
6. Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H₂SO₄)
7. Demonstration of photo colorimeter

8. Demonstration of spectrophotometer
9. Demonstration of Ph meter
10. Deproteinization of blood sample

BML-205 FUNDAMENTALS OF COMPUTER SCIENCE (THEORY) 45HOURS

Course Content

1. Introduction
2. MS Windows(Windows '98 SecondEdition)
3. Desktop, creation of folders and shortcuts, features of Windowsexplorer
4. MS Office packages – Word, Excel, PowerPoint, basic skills in using these tools

B.M.L.T., 2ND YEAR; SEMESTER III

BMLT-301 HEMATOLOGY AND BLOOD BANKING-I (THEORY) 45HOURS

Unit –I

RBCs, formation, morphology, cytoskeleton, anisocytosis, poikilocytosis, metabolism, role of 2, 3- BPG and oxygen dissociation curve. Anaemia and its classification, Morphological and etiological, pathogenesis, laboratory investigations and management, Iron deficiency anaemia, metabolism of iron, pathogenesis, laboratory investigations and management, principle and procedure of special test Megaloblastic anaemia, pernicious anaemia, pathogenesis, laboratory investigations

Unit-II

Haemoglobin, its synthesis and types, normal and abnormal hemoglobins, exextravascu and intravascular hemolysis. Hemolytic anaemia, pathogenesis and laboratory investigations, principle and procedure of special test, G-6-PD

Unit –III

Leukopoiesis, Stages of Leukocyte Maturation, Features of Cell Identification, leucocytosis and leucocytopenia, neutrophilia, eosinophilia, basophilia, monocytosis, lymphocytosis, neutropenia, lymphopenia, causes and significance, toxic granulation, Morphological alterations in neutrophil, effect of HIV on blood cellparameter

Unit-IV

Overview of hemostasis and coagulation, Stages of platelets development, Primary and Secondary hemostasis, Role of platelets, Role of coagulation factors, Coagulation inhibitorysystem, Fibrinolysis

Unit-V

General blood picture, estimation of iron, TIBC, Transferrin, Ferritin, Plasma haemoglobin, Vit. B12, Folic acid, FIGLU test, Schiling test, Parietal cell antibodies, G-6-PD, Osmotic fragility test, Heinz bodies, Perls Prussian staining, Platelet count, Platelet aggregation test, PT, INR APTT, Mixing experiments in PT and APTT, Thrombin time.

Unit- VI

Aplastic anaemia, Anaemia of chronic disorders, Sideroblasticanaemia, HaemolyticAnaemia, etiology, pathogenesis, clinical features, laboratory investigations, Bone marrow examination, composition & functions, aspiration techniques, processing andstaining

Unit-VII

Hemoglobinopathies, qualitative and quantitative, Sickle cell anaemia, sickle cell trait, etiology, pathogenesis, clinical features, and laboratory investigations, Disease management and prognosis, Sickling test, Thalassaemia, classification, etiology, pathogenesis clinicafeatures, laboratory investigations, hemoglobin electrophoresis

BMLT-306 HEMATOLOGY AND BLOOD BANKING-I (LAB) 3HOURS/WEEK

1. General blood picture
2. Determination of red cell indices
3. Demonstration of hypochromic microcytic slide.
4. Determination of G-6-PD
5. Differential Leukocyte Count.
6. Absolute leucocyte count
7. Demonstration of toxic granulation of neutrophil
8. To perform PT and Calculate INR
9. To perform APTT
10. To perform sickling test
11. Determination of Plasma Hemoglobin
12. To perform reticulocyte count.

BMLT-302 CLINICAL BIOCHEMISTRY-I (THEORY) 45HOURS

Unit-I

Introduction to Clinical Biochemistry and role of Medical Lab Technologist, ethics, responsibility, safety measure and hazards in clinical biochemistry lab and first aid in Laboratory accidents Glasswares & plastic ware's used in lab, calibration of volumetric apparatus, cleaning & care and maintenance

Unit II

Principle, working, care & maintenance and calibration of Weighing balance, Hotplate, Magnetic stirrer, Centrifuges, Incubator, Hot air oven, Colorimeter, Spectrophotometer, Water distillation plant, Deionizers Henderson Hassel Balch equation, pH paper, pH meter, method of pH measurement,

Unit-III

Preparation of solution and reagents, normal solution, molar solutions, percent solution, buffer solution, dilutions, w/v, v/v, standard solution, aqueous solutions, concepts of acid and base. Units of measurement: SI unit, reference range, conversion factor, units for measurement of bio metabolite, enzymes, protein, drugs, hormones, vitamins

Unit-IV

Specimen collection and processing of blood, urine & CSF, separation of serum and plasma, deproteinization of sample, Handling of specimens for testing, preservation of specimen, transport of specimen, factors affecting the clinical results, effect of storage on sample

Unit- V

Physical, chemical and microscopic examination of urine, Bence Jones Proteinuria and its clinical significance, qualitative test of urine for reducing sugars, protein, ketone bodies, bile Salt, bile pigments, urobilinogen, occult blood, uric acid, urea and Creatinine, quantitative estimation of 24 hrs urine for protein and their clinical significance.

BMLT-307 CLINICAL BIOCHEMISTRY-I (LAB) 3HOURS/WEEK

1. To identify carbohydrates in given solution by various methods.
2. To determine protein by Biuret method.
3. To perform protein test by various methods.
4. Physical examination of urine
5. Urine sugar determination by Benedict's method.
6. Protein by heat and acetic method
7. Bile salt, Bile pigments and Urobilinogen determination
8. Determination of Ketone bodies

9. Determination of various parameters of urine by uristic method.

BMLT- 303 BASIC AND CLINICAL PHARMACOLOGY (THEORY) 45HOURS

Unit-1

General Pharmacology: Pharmacology; Different branches of Pharmacology; Routes of drug administration; Absorption, Distribution, Metabolism and excretion of drugs; General mechanism of drug action; Animal used in experiments; Animal handling and ethics; Bioassay procedures; Instruments used in Pharmacology; Basics of Clinical trials.

Unit- II

Drugs Acting on CNS: General anesthetics; Anxiolytic and hypnotic drugs; Psychotropic agents; Epilepsy and Anticonvulsant drugs; Narcotic analgesics and antagonists; Centrally acting muscle relaxation and anti-parkinsonism agents; Analgesics; antipyretics; anti-inflammatory agents and Central nervous system stimulant; Local anesthetics.

Unit III

Drugs Acting on ANS: Autonomic nervous system and neurohumoral transmission; Cholinergic or parasympathetic drugs; Anticholinergic or parasympathomimetic drugs; BACHELOR OF MEDICAL LAB. TECHNOLOGY-BMLT Adrenergic or sympathomimetic drugs; sympatholytic drugs; Drugs acting on autonomic ganglion; Neuromuscular blockers.

Unit IV

Drugs Acting on Respiratory System: Bronchodilators; analeptics; Nasal decongestants, expectorants; antitussive agents.

Unit V

Drugs acting on Cardiovascular System: Antiarrhythmic drugs; Cardiotonics; Antianginal drugs; Antihypertensive drugs; Drugs used in atherosclerosis.

Unit VI

Drugs Acting on Blood and Blood Forming Organs: Haematinics – Iron (Fe); Coagulants; Anticoagulants; Blood and plasma expanders.

Unit VII

Hormones and Hormone Antagonists: Antithyroid drugs; Hypoglycaemic agents; Sex hormones and oral contraceptives; Corticosteroids.

Unit VIII

Opioid Analgesics: Endogenous opioid peptides; Opioid receptors; Effects of clinically used opioids; Morphine and related opioid agonists; Acute opioid toxicity; Opioid agonist & antagonist; Therapeutic uses of opioid analgesics.

Unit IX

Drug Addiction and Drug Abuse: Drug dependence; Physical dependence on Drugs;

BMLT- 304 HEALTH EDUCATION & HEALTH COMMUNICATION(THEORY) 45HOURS

Unit I:

- Health Education: Principles & Objectives, Levels of Health Education, Educational Methods, Evaluation & Practice of Health Education in India.
- Health Counseling: Introduction, Theories, Process & Techniques.
- Health Care Reporting, Role of NIC & Other Bodies, Research in Health Education

Unit II:

- Health Communication: Basic Concept & Principles of Communication, Definition, Purpose, Types of Communication
- Communication Process, Directions of Communication: Upward, Downward, Lateral, Factors influencing Communication, Barriers of Effective Communication, How to overcome the Barriers

- Models of communication: Aristotle Model, Shannon and Weaver model, Schramm Model, Laegans Model, Fano Model, Literer's Model, Westly Maclean's Model.

Unit III:

Mass communication & Role of Media in health education

- Information Communication Technologies (ICT) in health care and awareness. (Telemedicine & e-health, community radio)
- Future trends in information and communications systems:

BMLT-305 BIOMEDICAL WASTE MANAGEMENT (THEORY) 45HOURS

Unit 1: Present Scenario

Bio-medical waste – Concepts and Perceptions, Waste Generation, Segregation, Disposal

Unit 2:

Planning and Objectives of BMW Management, Survey, Policies and Perspectives of BMW Management

Unit 3:

Record Keeping, Management of Bio-medical Waste, Technologies for Treatment for BMW, Criteria for selecting appropriate Medical Waste Technologies

Unit 4:

Training, Occupational Safety and Health Issues

Unit 5:

Legal Aspects and Environment Concern, Implementation of Action Plan, Approaches to Common Regional facility

SEMESTER IV

BMLT-401 HEMATOLOGY AND BLOOD BANKING-II(THEORY) 45HOURS

Unit-I

Leukemia and its classification, WHO and FAB classification, AML, ALL, CML, CLL, its etiology, clinical features, laboratory investigations Cytochemistry involved in diagnosis of various types of leukemia.

Unit-II

Qualitative and quantitative disorders of platelets, hypercoagulable test, Disorders of secondary hemostasis, hemophilia and its lab diagnosis, Von- Willebrand disease, Disseminated intravascular coagulation, thrombosis, Disorder of fibrinogen, test for bleeding & coagulation disorders, correction, studies for factor deficiency, quantitative factor assay

Unit- III

LE cells, its demonstration and significance, lupus anticoagulants, Blood parasites, Malaria, Trypanosomes, Filariasis, Leishmania

Unit-IV

Basic Principles of Blood Banking, Antigen, Antibody, naturally occurring antibody, Complement, ABO & Rh blood group system, Methods of blood group determination, Forward and Reverse grouping, Slide & Tube method, Gel method.

Unit-V

Other blood group system such as Lewis, MNS, Kell Duffy etc. Anticoagulants and preservative used in blood bank, Donor selection criteria, Blood collection and processing

Unit-VI

Transfusion transmissible infectious disease screen, Coomb's test, Cross matching, Compatibility testing, Antibody Screening & Identification, Grading of Reaction/Agglutination

Unit-VII

Blood components and its preparation, preservation, storage and transportation.

Indications for different blood component transfusion, Blood transfusion reaction and its type, HDN Introduction of stem cell banking and bonemarrowtransplantationn.

Unit-VIII

Apheresis, indications of hemapheresis, plasmapheresisplateletpheresis, plasmapheresis
Quality control of reagentsequipments, and blood components used in transfusion medicine.
Role of NACO, Indian Red Cross Society, DGHS and blood transfusion services.

BMLT-406 HEMATOLOGY AND BLOOD BANKING-II (LAB) 3HOURS/WEEK

1. Staining of bonemarrow
2. Toper formsickling test.
3. To determine fetal haemoglobin
4. To perform Heinzbodies
5. Demonstration of leukemicslides
6. To perform LAPscoring
7. To determine total plateletcount
8. To perform
9. To perform PTT
10. To perform thrombin time.
11. To perform D-dimertest.
12. To determine fibrinogenconc.
13. General blood picture
14. Todemonstratemalarialslice
15. Haemoglobinelectrophoresis
16. Demonstration of hemiparasites like trypanosomes, Filaria, Malaria

BML-402 CLINICAL BIOCHEMISTRY- II(THEORY) 45HOURS

Unit-I

Introduction to enzymes, Classification of Enzymes, Isoenzymes, Concept of lock and key and induced fit theory, concept of activation energy and binding energy. Factors affecting enzyme activity

Unit-II

Coenzyme: Classification, various types and function, structure of NAD⁺, NADP⁺, FAD and FMN, PPP. Units for measuring enzyme activity, factors affecting enzyme Level in serum/plasma. Clinicalassay&itstype, kinetic assay and end poinassay foror theenzymes

Unit-III

Enzyme kinetics, the Michaelis-Menten equation and its physiological significances,
Enzyme Inhibition, types of inhibitors of enzyme

Unit-IV

Isoenzymes, their tissue distribution and clinical significance: ALT, AST, ALP, GGT, CPK, CKMB, LD H, Troponin, Myoglobin, Amylase, Lipase, ACP

Unit-V

Basic Concepts of Automation, principle, working and maintenance of various clinical chemistry analyzers, point of care testing, Hospital Laboratory Management

BMLT-407 -CLINICAL BIOCHEMISTRY-II (LAB) 3HOURS/WEEK

1. Preparation of hemolysate
2. To determine T3conc. in serum sample.
3. To determine T4conc. in serum sample.
4. To determine TSH conc. in serum sample.

5. To determine LH conc. in serum sample.
6. To determine FSH conc. in serum sample.
7. To determine Prolactin conc. in serum sample.
8. To determine TSH conc. in serum samples.
9. To perform TRIPLE test.
10. Demonstration of male and female infertility test.
11. Beta HCG

BMLT-403 BACTERIOLOGY, IMMUNOLOGY AND PARASITOLOGY(THEORY) 45HOURS

Unit-I

Historical background, general concepts of the immune system, innate and adaptive immunity; active and passive immunity; primary and secondary immune response. Cell and organs of immune system, Phagocytosis.

Unit-II

Antigens and haptens: Properties, foreignness, molecular size, heterogeneity, Band T cell epitopes; T dependent and T independent antigens. Antibodies: Historical perspective of antibody structure; structure, function and properties of the antibodies; different classes, subclasses and biological activities of antibodies; concepts of antibody diversity, isotype, allotype, Introduction of hybridoma technology, monoclonal antibodies, polyclonal antibody

Unit-III

Mechanism of humoral and cell mediated immune response. Introduction of Major Histocompatibility Complex, organization of MHC and inheritance in humans; Antigen presenting cells, antigen processing and presentation, Complement system and complement fixation test.

Unit-IV

Laboratory tests for demonstration of antigen – antibody reaction such as agglutination, precipitation, ELISA, RIA, Immunofluorescence,

Unit-V

Rheumatological diseases, etiology and pathogenesis and lab investigations

Unit-VI

Introduction of parasites, host, zoonosis, host parasites relationship, sources of infection, mode of infection, pathogenesis, immunity in parasitic infection

Lab diagnosis- Entamoeba histolytica, Malarial Parasites, Leishmania, Trypanosomes, their morphology, life cycle, pathogenesis, clinical features and lab diagnosis.

Helminthology: Introduction and classification, Taenia solium, Taenia Saginata, Fasciola, Ascaris, Wuchereria bancrofti their morphology, life cycle, pathogenesis, clinical features and lab diagnosis. Hookworm, Trichuris. Dracunculus their morphology, life cycle, pathogenesis, clinical features and lab diagnosis

Unit-VII

Diagnostic methods in Parasitology: Introduction, Examination of stool, urine, blood, Culture methods, Immunological diagnosis ayyyyyyyyyy

BMLT-408 BACTERIOLOGY, IMMUNOLOGY AND PARASITOLOGY (LAB) 3HOURS/WEEK

1. Demonstration of Microscope and its parts
2. Demonstration of glassware used in microbiology.
3. Demonstration of autoclave and sterilization of glassware.
4. Demonstration of Hot air oven and sterilization of glassware.

5. To perform Gram staining
6. To perform Acid-fast staining (Zeihl Neelsenstaining)
7. To perform Indian ink staining
8. To perform Hanging drop method
9. Demonstration of capsule
10. Staining of bacterial spores
11. To demonstrate agglutination reaction.
12. To perform RA test
13. To perform WIDAL test
14. To perform RPR test.
15. To perform CRP test.

BML-404 COMMUNITY MEDICINE(THEORY) 45HOURS

Unit I

Natural History of Disease: Determinants of health, multi – factorial causation of disease host, agent, and environment relationship primary, secondary and tertiary levels of prevention with examples related to few diseases of national importance.

Unit II

Mode of Transmission of Disease: Air – borne, vector and vehicle transmission; Methods of control with examples for control of each mode.

Unit III

Disinfection: Disinfection of the infective materials received in the Laboratory by using the appropriate disinfection methods, at the health centre level.

Unit IV

Health Services: Brief description of organization of health services at the centre and state levels; Primary Health Care - Definition, components and principles of primary health care; Health for all indicators; Primary Health Centre - The functions, staffing pattern and the role of laboratory technicians in primary Health Centre.

Unit V

National Programmes of Health and Disease Eradication /Control: Health Programmes Family Welfare Programme, National Programme for water supply and sanitation, Nutritional Programmes, Immunization and universal immunization programme; Disease Eradication programme - Leprosy & Guinea worm; Disease control programmes - Tuberculosis, Malaria, Filaria, S.T.D, Goitre, Cholera and other diarrhoeal diseases and National Programme for prevention of blindness including trachoma.

Unit VI

Demography & Population Control: The factors influencing population growth, death rate, birth rate and methods of contraception.

Unit VII

Biostatistics: Application of statistical principles in history; Presentation of data, calculation of mean, median and mode, range and standard deviation and their significance; Significance of 'T' test, Chi square values.

Unit VIII

Environmental Sanitation: Methods of water purification and disinfection, collection of water samples, their transport and bacteriological analysis; Methods of excreta disposal.

Unit VIII

Health Education: Definition, principles, objectives, purpose, types and AV aids; Communication - definition, process and types, Behavioral change communication; IEC

(Information education and communication) - aims, scope, concept and approaches; Inter personal relationship - Co-ordination and co-operation in health education with other members of the health team; Teaching and learning process, concept, characteristics of learner and educator; Role and skill of health professional in Health Education

B.M.L.T.; 3RD YEAR; SEMESTER V

BMLT-501 VIROLOGY, MYCOLOGY AND APPLIED MICROBIOLOGY-I (THEORY) 45HOURS

Unit- I

Western blotting, Immunodiffusion, Immuno electrophoresis, Hypersensitivity and its types
Introduction to Allergy and its laboratory test

Unit-II

Introduction of transplant immunology, graft rejection, tissue typing for kidney and bone marrow transplant, Laboratory test for transplant

Unit –III

Autoimmune disorders, pathogenesis, organ specific and systemic autoimmune disorders and its markers such parietal cell antibody, anti-sperm antibody, lupus anticoagulants, antimitochondrial antibody, ANA, ds DNA, HLA-B27, ASMA, anti CCP

Unit-IV

Immunological disorders: primary and secondary immunodeficiency, SCID, AIDS, Tumour, types of tumours, Various Tumour Markers, their significance and method of estimation.

Unit-V

Vaccines, classification and applications, Active and passive immunization, Immunoprophylaxis schedule in neonates, children and in pregnancy

Unit VI

Nature and Properties of Viruses, Introduction: Discovery of viruses, nature and definition of viruses, general properties, concept of viroids, virusoids, satellite viruses and Prions. Structure of Viruses: Capsid symmetry, enveloped and non-enveloped viruses Isolation, purification and cultivation of viruses, Viral taxonomy: Classification and nomenclature of different groups of viruses, Modes of viral transmission: Persistent, nonpersistent, vertical and horizontal. Viral multiplication and replication strategies: Interaction of viruses with cellular receptors and entry of viruses. Assembly, maturation and release of virions

Unit- VII

Poxviruses, Herpesviruses, hepaptitis viruses, retroviruses-HIV, Picorna viruses, rhabdoviruses, orthomyxoviruses and paramyxo viruses, TORCH profile, Symptoms, mode of transmission, prophylaxis and control of Polio, Herpes, Hepatitis, Rabies, Dengue, HIV, Influenza with brief description of swine flu, Ebola, Chikungunya, Japanese Encephalitis

Unit VIII

Introduction to oncogenic viruses, Types of oncogenic DNA and RNA viruses, concepts of oncogenes and proto-oncogenes, prevention & control of viral diseases, antiviral compounds and their mode of action, interferon and their mode of action, General principles of viral vaccination

BMLT-505 VIROLOGY, MYCOLOGY AND APPLIED MICROBIOLOGY-I (LAB) 3HOURS/WEEK

1. Leishman staining for malarial parasites
2. Demonstration of permanent slide of Trichuris, Ascaris and Hookworm
3. Saline wet mount for observing ova and eggs of parasites.

4. Iodine wet mount for observing ova and eggs of parasites.
5. Concentration of stool samples by floatation method
6. Zinc sulfate conc. Method for stool sample
7. Demonstration of various parasites by permanent slides.
8. Concentration of stool sample by sedimentation method
9. Serological diagnosis of Leishmania
10. Aldehyde Chopratest for Kala Azar
11. To perform HBsAg/ Australia Ag by rapid method
12. To perform HBs Ag by ELISA
13. To perform HIV Tridot method.
14. To perform HIV by ELISA
15. To perform TORCH profile
16. Demonstration of PCRHBV
17. Demonstration of PCR HIV Viral load

BMLT-502 HISTOPATHOLOGY AND CYTOPATHOLOGY TECHNIQUE (THEORY) 45HOURS

Unit-I

Staining of carbohydrates: preparation of Schiff reagent, PAS staining, Alcian blue, staining of glycogen, Amyloid, other staining method. Connective tissue & its staining: Trichrome staining, verhoeff stain, WeigertResorcin stain, Gordon's and Sweet stain, Gomori's method, von Geison stain,PTAH stain

Unit-II

Demonstration of minerals and pigments in tissue sample, Demonstration and identification of lipids, Demonstration of enzymes, diagnostic application and the demonstration of phosphatases, dehydrogenases, oxidases and peroxidases, Demonstration of micro organism on tissues pecimens, Bacteria, AFB, Actinomyces, spirochetes, fungi

Unit-III

Demonstration of nucleic acids, Processing and staining of bone marrow sample. Fixation, Processing and section cutting of bones, eye ball, Techniques in neuropathology: Neurons staining, Myelin, Neuropathology lab specimenhandling

Unit-IV

Demonstration of sex chromatin, Museum techniques, Electron microscopy: Principle and working, fixation, processing and staining of tissue Fluorescence Microscope: Principle and working

Unit- V

Immunohistochemistry: principle, types, applications, antigen retrieval, APAAP,PAP Staining, Quality control in histopathology

Unit-VI

Microtome, its type and working, various type of microtome,Microtome knives, its type and knife sharpening,Section cutting, fault and remedies,Section adhesive

Unit-VII

Cryostat, frozen sections of fresh, fixed and unfixed tissue, freeze drying, rapid frozen sections and staining for emergencydiagnosis, Dye chemistry, Stains and dyes, natural dye, acidic dye, basic dye, neutral dyes, fluorescence dye, mordant, accelerators, accentuators, metachromasia, metachromatic dyes

Unit- VIII

Progressive, regressive, vital, supravital staining, types of hematoxylin,Haematoxylin and

eosin staining, use of control sections in tissue staining, mounting and mounting media, advantages & disadvantages, refractive index

BMLT-506 HISTOPATHOLOGY AND CYTOPATHOLOGY TECHNIQUES (LAB) 3HOURS/WEEK

1. Demonstration of glass wares and equipment used in histopathology lab.
2. To prepare alcohol of different concentration.
3. To prepare formalin from stock solution.
4. To sharp knife by honing and stropping.
5. Grossing of tissue
6. To perform tissue processing by manual method.
7. To perform section cutting of paraffin embedded tissue.
8. To fix the smear on glass slide.
9. To perform hematoxylin and eosin staining.
10. Preparation of various cytological fixatives
11. Preparation of various stains used in cytology
12. Preparation of smear
13. To perform PAP staining
14. To perform Giemsa staining on fluid sample
15. To prepare cell suspension
16. Processing of various fluid samples

BMLT-503 HISTOTECHNOLOGY (THEORY) 45HOURS

Unit-I

Cell: basic structure and function, cell organelles, cell cycle, Benign and Malignant tumors, Instruments used in cytology, preparation of buffers, stains, Microscopy: Light, compound, phase contrast, fluorescence

Unit-II

Introduction of histopathology, cytology & histotechniques, laboratory organization, care & maintenance of equipments used in histotechnology lab, Safety measures in histotechnology lab Reception, Recording, Labelling and transportation of tissue specimens, Basic concepts of fixation and various types of fixative used in histopathology and cytopathology

Unit-III

Tissue and its types, Location and function, Grossing of tissues, whole mount, sections, smears, tissue processing and its steps, manual and automated method, components & principle of automatic tissue processor. Decalcification, decalcification methods, types of decalcifying fluid, Processing of bones and teeth, Embedding media, its type and properties

Unit-IV

Instruments and equipments used in cytology Fixation and Fixatives used in cytology, Adhesive and mounting media, Cell block and cytospin technique, Staining such as PAP, Diff-quick, MGG, H&E, Shorr staining, significance of PAP-HPV, Destaining and restaining of slides, Cover slipping

Unit-V

Aspiration and exfoliative cytology, Patient preparation, Sample collection, Fixation, Processing and Staining FNAC, collection, processing of sample and staining, on site quick staining procedure

Unit-VI

Pap staining, Progressive & Regressive, Hormonal cytology in different

agegroups, Collection and processing of sputum, BAL, CSF, Pleural, peritoneal and pericardial fluid, Gynaecologic sample

Unit-VII

Sex chromatin demonstration, Introduction of Immunocytochemistry, different markers and its applications, Automation in cytology, Liquid based preparation & automated screening device

BMLT-504 CLINICAL ENZYMOLOGY & AUTOMATION (THEORY) 45HOURS

Unit-I

Introduction to enzymes, Classification of Enzymes, Isoenzymes, Concept of lock and key and induced fit theory, concept of activation energy and binding energy. Factors affecting enzyme activity

Unit-II

Coenzyme: Classification, various types and function, structure of NAD⁺, NADP⁺, FAD and FMN, PPP. Units for measuring enzyme activity, factors affecting enzyme level in serum/plasma. Clinical assay & its type, Kinetic assay and end point assay for the enzymes

Unit-III

Enzyme kinetics, the Michaelis-Menten equation and its physiological significances, Enzyme Inhibition, types of inhibitors of enzyme

Unit-IV

Isoenzymes, their tissue distribution and clinical significance: ALT, AST, ALP, GGT, CPK, CKMB, LDH, Troponin, Myoglobin, Amylase, Lipase, ACP

Unit-V

Basic Concepts of Automation, principle, working and maintenance of various clinical chemistry analyzers, point of care testing, Hospital Laboratory Management

SEMESTER VI

BMLT-601: ESSENTIALS OF MEDICAL PHARMACOLOGY (THEORY) 45HOURS

Unit-I

Hormones, Classification of hormones, organs of endocrine system their secretion and function, regulation of hormone secretion, Mechanism of action

Unit-II

Thyroid function test: Thyroid hormones, biological function, hypothyroidism, hyperthyroidism, Determination of T₃, T₄, TSH, FT₃, FT₄, TBG, Disorder associated with thyroid dysfunction.

Unit-III

Infertility profile: LH, FSH, TSH, Estrogen, Progesterone, Total Testosterone, Free testosterone, DHEA-S, 17-Ketosteroids, Prolactin, their estimation and clinical significance, reference range, hypo and hyper secretion, Triple Test

Unit-IV

Growth hormone, ACTH, Aldosterone, Cortisol their estimation and clinical significance, reference range, hypo and hyper secretion

Unit-V

Introduction of Toxicology, Alcohol poisoning, Lead poisoning, Zinc poisoning, Mercury poisoning drugs abuse, screening procedure for drug screening, Spot tests, hair and urine test, Immunoassay for drugs.

BMLT-603: BIOMEDICAL TECHNIQUES, LAB MANAGEMENT AND ETHICS (THEORY) 45HOURS

Unit-I

Chromatography, its principle, types and applications. Paper Chromatography, Thin layer chromatography, HPLC, Gas liquid chromatography, Ion exchange chromatography and their application in diagnosis.

Unit-II

Basic Principle of electrophoresis, Paper electrophoresis, Gel electrophoresis, PAGE, SDS-PAGE, Agarose gel electrophoresis, buffer systems in electrophoresis. Electrophoresis of proteins and nucleic acids, haemoglobin, immunoglobulin's, isoenzymes Applications of electrophoresis in clinical diagnosis.

Unit-III

Centrifugation, fixed angle and swinging bucket rotors, RCF and sedimentation coefficient, differential centrifugation, density gradient centrifugation and Ultracentrifugation.

Unit-IV

Radioisotopes, Radioactivity, instruments for radioactivity measurement, applications of radioisotopes in clinical biochemistry

Unit-V

Immunoassay: ELISA, RIA, FIA, FACS and their applications in clinical diagnosis.

Unit-VI

Ethical Principles and standards for a clinical laboratory professional duty to the patient, duty to colleagues and other professionals, Good Laboratory Practice (GLP), Introduction to Basics of GLP and Accreditation, Aims of GLP and Accreditation, Advantages of Accreditation, Brief knowledge about National and International Agencies for clinical laboratory accreditation

Unit-VII

Awareness/Safety in a clinical laboratory, General safety precautions. HIV: pre- and post-exposure guidelines, Hepatitis B & C: pre- and post-exposure guidelines, Drug Resistant Tuberculosis. Patient management for clinical samples collection, transportation and preservation, Sample accountability, Purpose of accountability, Methods of accountability

Unit-VIII

Sample analysis: Introduction, factors affecting sample analysis, reporting results, basic format of a test report, reported reference range, clinical alerts, abnormal results, results from referral laboratories, release of examination results, alteration in reports

JIS UNIVERSITY

[Syllabus for Bachelor of Medical Laboratory Technology (BMLT) Course]

Unit-IX

Quality Management system: Introduction, Quality assurance, Quality control system, Internal and External quality control, quality control chart, Biomedical Introduction and importance of calibration and Validation of Clinical Laboratory instrument, Ethics in Medical laboratory Practice, Ethics in relation to Pre-Examination procedures, Examination procedures, reporting of results, preserving medical records, Procurement of equipment and Inventory Control,

Unit-X

Audit in a Medical Laboratory, Introduction and Importance, NABL & CAP, Responsibility, Planning, Horizontal, Vertical and Test audit, Frequency of audit, Documentation

BMLT- 601 DIAGNOSTIC MOLECULAR BIOLOGY(THEORY) 45HOURS

Unit I

Basic transcription apparatus, Initiation, elongation and termination of transcription, Eukaryotic Transcription of mRNA, tRNA and rRNA, types of RNA polymerases, transcription factors Introduction of translation

Unit-II

Nucleic acid amplification testing, PCR, Principle, Types, applications, Thermal cycler, RT-PCR, reverse transcriptase PCR, Nested PCR

Unit-III

Blotting techniques, southern blotting and Western blotting
Introduction to chromosomes, its structure and disorder, Karyotyping, Chromosomal studies in hematological disorders (PBL and Bone marrow), FISH

Unit-IV

Radioisotopes and its application in measurement of blood volume, Determination of red cell volume and plasma volume, red cell lifespan, platelet lifespan, radiation hazards and its prevention disposal of radioactive material
Introduction and applications of Flow cytometry, Stem cell banking, Prenatal Diagnosis

Unit-V

Nucleic Acids, DNA, RNA, composition, structure, types, denaturation and renaturation of DNA, chemistry of DNA synthesis, general principles of replication, enzyme involved in DNA replication
– DNA polymerases, DNA ligase, primase, telomerase and other accessory proteins.

BMLT604 -DIAGNOSTIC MOLECULAR BIOLOGY(LAB) 3HOURS/WEEK

1. Isolation of DNA
2. Separation of DNA by Agarose gel electrophoresis
3. Demonstration of thermal cycler and PCR.
4. HIV test by Western Blotting
5. To perform karyotyping
6. Demonstration of PCR HLAB-27
7. Demonstration of PCR HIV
8. Demonstration of PCR MTB

BMLT-605 : HOSPITAL INTERNSHIP AND PROJECT

Students shall be deputed to various labs of Pathology department wherein they shall undergo practical training of handling patients, collection and processing of blood, urine, sputum stool and body fluids samples.

Identification of patient's particulars based on CR number, Lab Number and transfer of samples from collection centres to different labs. Process of performing various tests in different labs.

Each student is required to maintain a logbook of the various posting.

Student's performance shall be evaluated on continuous basis by the faculty posted in various sections. The faculty shall submit the assessment records of each student posted in his/her section on monthly basis to the HOD. Marks will be awarded out of 100.