**MEWAR UNIVERSITY, GANGRAR (RAJ.)**

**B.Sc. Medical Laboratory Technology**

**BMLT - 1st Semester syllabus**

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|  | **Current Sub Code** | **Subjects** | **Contect Hrs Per week** | | | **Credit Hrs** | **Internal Assessment /Evaluation** | | **External examination/viva-voce** | **Grand Total** |
| **S.NO.** | **L** | **T** | **P** | **Assig/lab record** | **Teachers evaluation** |
| 1 | BMLT-101 | Human Anatomy [ including Histology ]I | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 2 | BMLT-102 | Human Physiology I | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 3 | BMLT-103 | Clinical Biochemistry I | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 4 | BMLT-104 | Medical Microbiology –I | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 5 | BMLT-105 | Basic Pathology I | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 6 | ELGA101 | English Language and General Awareness-I {ELGA-1} | 1 |  |  | 1 |  |  | 25 | 25 |
| 7 | BMLT-107 | Health Care | 4 |  |  | 4 | 35 | 15 | 50 | 100 |
| 8 | BMLT-108 | Human Anatomy lab I |  |  | 3 | 2 | 15 | 10 | 25 | 50 |
| 9 | BMLT -109 | Human Physiology lab I |  |  | 3 | 2 | 15 | 10 | 25 | 50 |
| 10 | BMLT-110 | Clinical Biochemistry lab I |  |  | 3 | 2 | 15 | 10 | 25 | 50 |
| 11 | BMLT-111 | Medical Microbiology lab I |  |  | 3 | 2 | 15 | 10 | 25 | 50 |
| 12 | BMLT-112 | Basic Pathology lab I |  |  | 3 | 2 | 15 | 10 | 25 | 50 |
|  | Total |  | 25 |  | 15 | 35 |  |  |  | 875 |

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-101]: Human Anatomy [including Histology] I**

**UNIT-1ST:**

1. **Introduction: Human Body as a Whole**:

Definition of anatomy and its divisions; Terms of location, positions and planes Cell and its organelles; Epithelium-definition, classification, describe with examples, function.

Glands- classification, describe serous & mucous glands with examples;

Basic tissues–classification with examples.

2. **Locomotion and support**

Cartilage – types with example & histology; Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of fetal skull; Joints – Classification of joints with examples, synovial joint (in detail for radiology);Muscular system: Classification of muscular tissue & histology; Names of muscles of the body.

**UNIT-2nd:**

1. **Cardiovascular system**

Heart-size, location, chambers, exterior & interior Blood supply of heart, Systemic & pulmonary circulation, Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, Peripheral pulse Inferior venacava, portal vein, portosystemic anastomosis, Great saphenous vein Dural venous sinuses, Lymphatic system- cisterna chyli & thoracic duct, Histology of lymphatic tissues, Names of regional lymphatics, axillary and inguinal lymph nodes in brief

**UNIT-3rd:**

1. **Respiratory system:**

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments

Histology of trachea, lung and pleura,Names of paranasal air sinuses

2. **Peritoneum:** Description in brief

**REFERENCE BOOKS**

1. William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill

2. Chaursia –A Text book of Anatomy T.S. Ranganathan – A text book of Human Anatomy

3. Fattana, Human anatomy (Description and applied) Saunder’s & C P Prism Publishers, Bangalore – 1991

4. ESTER . M. Grishcimer,Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-108]: Human Anatomy Practical [including Histology] I**

**PRACTICALS:**

1. Histology of types of epithelium; Histology of serous, mucous & mixed salivary gland
2. Histology of the 3 types of cartilage; Demo of all bones showing parts, radiographs of normal bones & joints; Histology of compact bone (TS & LS); Demonstration of all muscles of the body; Histology of skeletal (TS & LS), smooth & cardiac muscle
3. Demonstration of heart and vessels in the body, Histology of large artery, medium sized artery & vein, large vein, Microscopic appearance of large artery, medium sized artery & vein, large vein, pericardium, Histology of lymph node, spleen, tonsil & thymus,Normal chest radiograph showing heart shadows,Normal angiograms
4. Demonstration of parts of respiratory system, Normal radiographs of chest,Histology of lung and trachea
5. Demonstration of reflections

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-102]: Human Physiology I**

**UNIT-I:**

1. **Cell :**  Definition ,Structure and functions the cytoplasmic Organelles

Reproduction Meiosis, Mitosis The important physico-chemical laws

applied to physiology Diffusion , Osmosis , Bonding , Filtration

,Dialysis , Surface Tension , Adsorption ,Colloid

1. **Physiology of different types of tissue:** Epithelial tissue , Muscular tissue,Nervouse tissue

**UNIT-II:**

1. **LYMPH & CARDIOVASCULAR SYSTEM:**

Lymph–lymphoid tissue formation, circulation, composition and function of lymph,Cardiovascular system: Heart – Physiological Anatomy, Nerve supply, Properties of Cardiac muscle, Cardiac cycle-systole,diastole. Intraventricular pressure curves. Cardiac Output – only definition, Heart sounds Normal heart sounds Areas of auscultation. Blood Pressure – Definition, normal value, clinical measurement of blood pressure. Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension. Pulse – Jugalar, radial pulse, Triple response, Heart sounds – Normal heart sounds, cause characteristics and signification. Heart rate Electrocardiogram (ECG) –significance.

**UNIT-III:**

1. **DIGESTIVE SYSTEM**

Digestive System- Physiological anatomy of Gastro intestinal tract, Functions of digestive system, Salivary glands Stucture and functions. Deglutination –stages and regulation. Stomach – structure and fuctions, Gastric secretion – Composition function regulation of gastric juice secretion, Pancrease – structure, function, composition, regulation of pancreatic juice, Liver – functions of liver, Bile secretion, composition, function regulation of bile secretion .Bilirubin metabolism, types of bilirubin, Vandernberg reaction, Jaundice- types, significance. Gall bladder–functions, Intestine – small intestine and large intestine,Small intestine–Functions- Digestive, absorption ,movements. Large intestine–Functions, Digestion and absorption of Carbohydrates,Proteins, Fats,Lipids.Defecation

1. **RESPIRATORY SYSTEM:**

Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, stages of respiration. Mechanism of normal and rigorous respiration. Forces opposing and favoring expansion of the lungs. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall. H-Transportation of Respiratory gases:Transportation of Oxygen : Direction, pressure gradient, Forms of transportation, Oxygenation of Hb. Quantity of Oxygen transported. Lung volumes and capacities, Regulation of respiration what? Why? How? Mechanisms of Regulation, nervous and chemical regulation. Respiratory centre. Hearing Brier, Reflexes. Applied Physiology and Respiration: Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea.

**REFERENCE BOOKS:**

1. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers

2. Chatterjee(CC) Human Physiology Latest Ed.,Vol-1, Medical Allied Agency

3. Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book,

4. Ganong (William F) Review of Medical Physiology. Latest Ed . Appleton

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**B. Sc Medical Laboratory Technology**

**BMLT {1st YEAR}**

**[BMLT-109]: Human Physiology Practical I**

**PRACTICALS:**

1. Haemoglobinometry,
2. White Blood Cell count
3. Red Blood Cell count
4. Determination of Blood Groups
5. Leishman’s staining and Differential WBC count
6. Determination of packed cell Volume

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**BMLT-103: Clinical Biochemistry -I**

**Unit- I**

1. Introduction of Biochemistry , Aim & Scope of Biochemistry.

2. Laboratory Safety and First aid kit.

3. Role and Responsibilities of the laboratory technologist.

4.Introduction to Laboratory glassware & apparatus: Pipettes- different types

(Graduated, volumetric, Pasteur, Automatic etc.) Burettes, Beakers,Petri dishes,

depression plates. Flasks-different types ,Bottles – Reagent bottles – graduated and

common, Wash bottles– different type Specimen bottles etc Laboratory management and

Maintenance of Records

**Unit- II**

., Maintenance of laboratory glassware and apparatus , care and cleaning of glass ware, different cleaning solutions of glas & plasticsware.

2. Instruments and Laboratory Techniques:

Water bath: Use, care and maintenance; Oven & Incubators: Use, care and

Maintenance. Water Distillation plant and water deionizers. Use, care and maintenance,

Refrigerators, –Use, care and maintenance, Centrifuges (Theory and demonstration)

Laboratory balances.

**Unit -III Atomic structure:**

1. Dalton’s theory, Properties f electrons, protons, neutrons, and nucleus, Rutherford’s

model of atomic structure, Bohr’s model of atomic structure, orbit and orbital, Quantum

numbers, Molecular weight, equivalent weight of elements and compounds.

1. Radioactive isotope: Radioactivity , Half Life, Application in biochemistry .

**REFERENCE BOOKS**

1. Varley – Clinical chemistry

2. TEITZ – Clinical chemistry

3. Kaplan – Clinical chemistry

4. Ramakrishna(S) Prasanna(KG), Rajna ® Text book of Medical Biochemistry Latest Ed Orient longman Bombay –1980

5. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students, Latest Ed

6. DAS (Debajyothi) Biochemistry Latest ED Academic, Publishers, Culcutta – 1992

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-110]: Clinical Biochemistry Practical -I**

**PRACTICALS**

1. Preparation of Solution.
2. Preparation of Molar solution .
3. Procedure for routine screening
4. Urinary screening for inborn errors of metabolism
5. Common renal disease
6. To study of general glassware.
7. Urine examination for detection of abnormal constituents

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-104]: Medical Microbiology –I**

**UNIT-I:**

1. **Morphology:**

Historical aspect of microbiology, contribution of various scientist.

Classification of microorganisms, size, shape and structure of bacteria. Use of

Microscope in the study of bacteria. Staining technique: Simple staining Negative

Staining ,Gram staining , Spore staining .

1. **Growth and nutrition:**

Nutrition, growth and multiplications of bacteria, Sexual and asexual reproduction,

use of culture media in diagnostic bacteriology.

**UNIT-II:**

1. **Sterilisation and Disinfection:**

Principles and use of equipments of sterlization namely Hot Air oven, Autoclave and serum inspissrator. Pasteurization, Anti septic and disinfectants. Antimicrobial sensitivity test

1. **Immunology:**

Immunity Vaccines, Types of Vaccine and immunization schedule, Principles and interpretation of commonly had done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg (Technical details to be avoided)

**UNIT-III:**

1. **Systematic Bacteriology:**

Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (the classification, antigenic structure and pathogenicity are not to be taught) Staphyloccci, Streptococci, Pneumococci, Gonococci, Menigococci, Cdiphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus,vibrio cholerae, Pseudomonas & Spirochetes

**REFERENCE BOOKS**

1. Anathanarayana & Panikar Medical Microbioloty

2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology

3. Chatterjee – Parasitology – Interpretation to Clinical medicine.

4. Rippon – Medical Mycology

5. Emmons – Medical mycology

6. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi – 199

7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers,New Delhi

8. Medical Parasitology – Ajit Damle

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-111]: Medical Microbiology Practical –I**

**PRACTICAL**:

1. Compound Microscope, Demonstration and sterlization of equipments–Hot Air oven, Autoclave, Bacterial filters.
2. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chacolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph Antibiotic susceptibility test

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-105]: BASIC PATHOLOGY-I**

UNIT-1

1. Introduction of Pathology & Their functional components.
2. Blood: - Definition, Composition & Function.
3. Collection of Blood and various sites for the collection of blood.
4. Various Anticoagulants used in Hematology.

UNIT-II

The Cell in health and disease:-

1. Inflammation: – Acute and Chronic
2. Neoplasia:- Introduction , Etiology & Pathogenesis
3. Complement System:- Introduction & Their types
4. Derangement of Body Fluids and Electrolytes :- Types of shocks , Ischemia & Infection

Unit-III

Various types of Body Fluids:-

1. Urine: Method of Collection • Normal Constituents • Physical Examination • Chemical Examination
2. Stool Examination : - Method of Collection • Normal Constituents and appearance • Abnormal Constituents (Ova, Cyst)
3. C.S.F. Examination:- Physical Examination • Chemical Examination • Microscopy • Cell Count • Staining
4. Semen Analysis:- Collection • Examination • Special Tests

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-112]: BASIC PATHOLOGY PRACTICAL -I**

**PRACTICALS:**

1. Urine Examination.
2. Physical
3. Chemical
4. Microscopic
5. Stool examination
6. Urine sugar
7. Urine protein

**REFERENCE BOOKS**

1. Culling Histopathology techniques

2. Bancroft Histopathology techniques

3. Koss – cytology

4. Winifred greg – Diagnostic cytopathology

5. Orell – Cyto Pathology

6. Todd & Sanford Clinical Diagnosis by laboratory method

7. Dacie & Lewis – Practical Haematology

8. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed., J.P. Bros, New Delhi –1996)

9. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi – 1998

10.Sachdev K.N. Clinical Pathology and Bacteriology 8th Ed, J.P. Bros, New Delhi-1991.

11. Krishna - Text book of Pathology, Orient Longman PVT Ltd.

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**ELGA-101: English Language and General Awareness-I {ELGA-I}\*\***

**Grammar and Vocabulary:**

Unit 1: Word skills

Unit 2: Tense, Active and Passive Voice

Unit 3: Direct and Indirect Narration

Unit 4: Punctuation

Unit 5: Common errors

**Indian Polity:**

Unit 1: Indian Constitution

Unit: 2 Indian Parliamentary System

Unit: 3 Election and Judiciary

Unit 4: Panchayati Raj and local bodies

Unit 5: National Symbols and Indian Culture

**\*\*As per B.Tech Sem-1st Or B.Com 1st Year of ELGA-I**

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**B. Sc Medical Laboratory Technology**

**BMLT {1st Semester}**

**[BMLT-107]: HEALTH CARE**

**UNIT-1st: INTRODUCTION TO HEALTH**

Definition of Health, Determinants of Health,Health Indicators of India, Health Team Concept. National Health Policy, National Health Programmes (Briefly Objectives and scope).

Population of India and Family welfare programme in India

**Unit-2nd: INTRODUCTION TO NURSING**

What is nursing? Nursing principles, Inter-Personnel relationships, Bandaging: Basic turns, Bandaging extremities, Triangular Bandages and their application,

Nursing Position, Bed making, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, Aids and rest and sleep. Lifting And Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.

**Unit-3rd: BED SIDE MANAGEMENT**

Giving and taking Bed pan, Urinal: Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving, Methods Of Giving Nourishment: Feeding, Tube feeding, drips, transfusion Care Of Rubber Goods, Recording of body temperature, respiration and pulse, Simple aseptic technique, sterlization and disinfection.

Surgical Dressing: Observation of dressing procedures. First Aid.

**B.Sc. Medical Laboratory Technology**

**BMLT- 2nd Semester syllabus**

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| **S.NO.** | **Current Sub Code** | **Subjects** | **Contect Hrs Per week** | | | | | **Credit Hrs** | | **Internal Assessment /Evaluation** | | | | **External examination/viva-voce** | | | **Grand Total** |
| **L** | **T** | | **P** | | **Assig/lab record** | **Teachers evaluation** | | |
| 1 | BMLT-201 | Human Anatomy [ including Histology ]II | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 2 | BMLT-202 | Human Physiology II | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 3 | BMLT-203 | Clinical Biochemistry II | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 4 | BMLT-204 | Medical Microbiology -II | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 5 | BMLT-205 | Basic Pathology II | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 6 | ELGA-102 | English Language and General Awareness-I {ELGA-II} | 1 |  | |  | | 1 | |  |  | | | 25 | | | 25 |
| 7 | BMLT-207 | Instrumentation & Techniques | 4 |  | |  | | 4 | | 35 | 15 | | | 50 | | | 100 |
| 8 | BMLT -208 | Human Anatomy lab II |  |  | | 3 | | 2 | | 15 | 10 | | | 25 | | | 50 |
| 9 | BMLT-209 | Human Physiology lab II |  |  | | 3 | | 2 | | 15 | 10 | | | 25 | | | 50 |
| 10 | BMLT-210 | Clinical Biochemistry lab II |  |  | | 3 | | 2 | | 15 | 10 | | | 25 | | | 50 |
| 11 | BMLT-211 | Medical Microbiology lab II |  |  | | 3 | | 2 | | 15 | 10 | | | 25 | | | 50 |
| 12 | BMLT-212 | Basic Pathology lab II |  |  | | 3 | | 2 | | 15 | 10 | | | 25 | | | 50 |
|  | Total |  | 25 |  | | 15 | | 35 | |  |  | | |  | | | 875 |

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-201]: HUMAN ANATOMY [INCLUDING HISTOLOGY]**

**UNIT-I**

**Urinary system:**

Kidney, ureter, urinary bladder, male and female urethra, Histology of kidney, ureter and urinary bladder

2. **Reproductive system**

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology),Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology) Mammary gland – gross

3.**Digestive System:**

Basic structure of alimentary canal ,Mouth, Salivary glands ,Pharynx ,Oesophagus, Stomach , Small intestine , Large intestine , rectum ,anal canal , pancreas , Liver

**UNIT-II**

1. **Endocrine glands**:

Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid

gland, suprarenal glad – (gross & histology)

2. **Nervous system**

Neuron, Classification of NS, Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology),Meninges, Ventricles & cerebrospinal fluid Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk & names of parasympathetic ganglia

**UNIT-III**

1. **Sensory organs**:

Skin: Skin-histology, Appendages of skin

Eye: Parts of eye & lacrimal apparatus,Extra-ocular muscles & nerve supply

Ear: parts of ear- external, middle and inner ear and contents 2. **Embryology**: Spermatogenesis & oogenesis, Ovulation, fertilization, Fetal circulation Placenta

**REFERENCE BOOKS**

1. William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill

2. Chaursia –A Text book of Anatomy T.S. Ranganathan – A text book of Human Anatomy

3. Fattana, Human anatomy (Description and applied) Saunder’s & C P Prism Publishers, Bangalore – 1991

4. ESTER . M. Grishcimer,Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-208]: HUMAN ANATOMY PRACTICAL -II [INCLUDING HISTOLOGY]**

**PRACTICALS:**

1. Demonstration of parts of urinary system,Histology of kidney, ureter, urinary bladder,
2. Radiographs of abdomen-IVP, retrograde cystogram
3. Demonstration of section of male and female pelves with organs in situ,Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary,Radiographs of pelvis – hysterosalpingogram
4. Demonstration of the glands,Histology of pituitary, thyroid, parathyroid, suprarenal glands
5. Histology of peripheral nerve & optic nerve,Demonstration of all plexuses and nerves in the body, Demonstration of all part of brain, Histology of cerebrum, cerebellum, spinal cord
6. Histology of thin and thick skin, Demonstration and histology of eyeball, Histology of cornea & retina

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-202]: HUMAN PHYSIOLOGY-II**

**UNIT-1st:**

1. **ENDOCRINE SYSTEM**

Definition Classification of Endocrine glands & their Harmones, Properties of Harmones.

Thyroid gland hormone–Physiological, Anatomy, Hormone scerated, Physiological function, regulation of secretion. Disorders – hypo and hyper secretion of hormone Adrenal gland, Adrenal cortex physiologic anatomy of adrenal gland, Adrenal cortex, cortical hormones– functions and regulation, Adrenal medulla – Hormones , regulation and secretion. Functions of Adrenaline and nor adrenaline, Pituitary hormones–Anterior and posterior pituitary hormones, secretion, function, Pancreas–Hormones of pancreas, Insulin–secretion, regulation, function and action Diabetes mellitus–Regulation of blood glucose level, Parathyroid gland–function, action, regulation of secretion of parathyroid hormone. Calcitonin–function and action , Endocrine functions of testes Androgens–Testosterone structure and functions. Female reproducive syustem.Ovulation, menstrual cycle.

2.Special senses, Vision– structure of eye. Function of different parts. Structure of retina, Hearing structure and function of can mechanism of hearing ,Taste –Taste buds functions . Smell physiology, Receptors.

**UNIT-II:**

1. **NERVOUS SYSTEM**

Functions of Nervous system, Neurone structure, classification and properties. Neuroglia, nerve fiber, classification ,conduction of impulses continuous and saltatory.Velocity of impulse transmission and factors affecting. Synapse – structure, types, properties. Receptors–Definition, classification ,properties. Reflex action–unconditioned properties of reflex action. Babinski’s sign. Spinal cord nerve tracts. Ascending tracts, descending tracts–pyramidal tract –Extrapyramidal tracts. Functions of Medulla, pons, Hypothalamic disorders. Cerebral cortex lobes and functions, Sensory cortex, Motor cortex,Cerebellum functions of Cerebellum.Basal ganglion-funtions. EEG. Cerebro Spinal Fluid (CSF) : formation, circulation, properties, composition and functions lumbar puncture. Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions.

Unit III

1. **EXCRETORY SYSTEM**
2. Excretory organs, Kidneys: Functions of kidneys structural and functional unit nepron, vasarecta, cortical and juxtamedullary nephrons – Comparision, Juxta Glomerular Apparatus –Structure and function. Renal circulation peculiarities. Mechanism of Urine formation : Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR. Determination of GFR selective reabsorption–sites of reabsorption ,substance reabsorbed, mechanisms of reabsorption Glucose, urea. H+Cl aminoacids etc. TMG, Tubular lead, Renal threshold % of reabsorption of different substances, selective e secretion. Properties and composition of normal urine, urine output
3. **REPRODUCTIVE SYSTEM**

Function of Reproductive system, Puberty, male reproductive system. Functions of testes,

spermatogenesis site, stages, factors influencing semen. Physiological changes during pregnancy, pregnancy test. Lactation: Composition of milk factors controlling lactation. Muscle nerve physiology Classification of muscle, structure of skeletal muscle, Sarcomere contractile proteins, neuromuscular junction. Transmission across, Neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue Rigour mortis Skin -structure and function Body temperature measurement, Physiological variation, Regulation of body Temperature by physical chemical and nervous mechanisms. Role of Hypothalamus, Hypothermia and fever.

**REFERENCE BOOKS:**

1. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers

2. Chatterjee(CC) Human Physiology Latest Ed.,Vol-1, Medical Allied Agency

3. Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book,

4. Ganong (William F) Review of Medical Physiology. Latest Ed . Appleton

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-209]: HUMAN PHYSIOLOGY PRACTICAL II**

**PRACTICALS:**

1. Calculation of Blood indices
2. Determination of Clotting Time, Bleeding Time
3. Blood pressure Recording
4. Auscultation for Heart Sounds
5. Artificial Respiration
6. Determination of vital capacity

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**BMLT-203: CLINICAL BIOCHEMISTRY-II**

**UNIT-1st:**

1. Measurement unit: SI.MKS,& CGS
2. Solution : Introduction types . Molarity,Normality ,Molar, Normal & percent solution .

Preparation of molar solutions (mole/litre solution) [Example: 1 M NaCl, 0.15 M NaCl

1 M NaOH, 0.1 M HCl, 0.1 M H2S04 & 1N Na2CO3, O.1N Oxalic acid, 0.1 N HCl, 0.1N

H2S04, 0.66 N H2S04.Buffer solution .

3*.*Saturated and supersaturated solutions: Standard solutions. Technique for preparation of standard solutions [Example: Glucose, urea], Significance of volumetric flask in preparing standard solutions. Volumetric flasks of different sizes, Preparation of standard solutions of deliquescent compounds

**Unit:II**

1. *Acids and Bases*: Definition, physical and chemical properties with examples, Lowery – Bronsted theory of acids and bases

2. Acids and Bases, pH Measurements: - pH indicators, pH paper and pH meter.

3. Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation, Disposal of Biological waste.

4. *Salts*: Definition, classification, water of crystallization–definition and different types,

deliquescent and hygroscopic salts

**UNIT-3rd:**

1. **Quality control**:

Accuracy, Precision, Specificity, Sensitivity, Limits of error allowable in laboratory

Percentage error, Normal values and Interpretations,

***Special Investigations*:** Immunoglobulin Drugs: Regulation of Acid Base status: Henderson Hasselback Equations, Buffers of the fluid, pH Regulation, Disturbance in acid Base Balance, Anion Gap, Metabolic acidosis, Metabolic acidosis, Metabolic alkalosis, Respiratory acidosis, Respiratory alkalosis,

**REFERENCE BOOKS**

1. Varley – Clinical chemistry

2. TEITZ – Clinical chemistry

3. Kaplan – Clinical chemistry

4. Ramakrishna(S) Prasanna(KG), Rajna ® Text book of Medical Biochemistry Latest Ed Orient longman Bombay –1980

5. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students, Latest Ed

6. DAS (Debajyothi) Biochemistry Latest ED Academic, Publishers, Culcutta – 1992

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-210]: CLINICAL BIOCHEMISTRY PRACTICAL-II**

**PRACTICALS**

1. Analysis of Normal Urine
2. Composition of urine
3. Procedure for routine screening
4. Urinary screening for inborn errors of metabolism
5. Common renal disease
6. Urinary calculus
7. Ph measurement
8. Urine bile salt & bile pigment

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-204]: MEDICAL MICROBIOLOGY-II**

**UNIT-I:**

1. **Parasitology**:

Morphology, life cycle, laboratory diagnosis of following parasites E. histolytica, Plasmodium, Tape worms, Intestinal nematodes

1. **Mycology:**

Morphology, diseases caused and lab diagnosis of following fungi, Candida, Cryptococcus, Dermatophytes ,opportunistic fungi.

1. Staining technique: LCB, Gram staining Acid fast staining and Albert staining

**UNIT-II:**

1. **Virology**:

General properties of viruses, Morphological types of viruses ,Classification on the basis of nucleic acid, cultivation of viruses(cell culture , organ culture,embryonated egg ) diseases caused , lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis .

1. Antimicrobial drug: History of antimicrobial drug ,Mode of action , Various antibacterial a,antifungal and antiviral .

**UNIT-III:**

1. **Transmission of infection :** Epidemic ,pandemic & Endemic infection
2. **Hospital management**: Hospital infection, Causative agents, transmission methods, investigation, prevention and control Hospital infection.
3. **Biomedical waste management:** Principles and practice Biomedical waste management

**REFERENCE BOOKS**

1. Anathanarayana & Panikar Medical Microbioloty

2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology

3. Chatterjee – Parasitology – Interpretation to Clinical medicine.

4. Rippon – Medical Mycology

5. Emmons – Medical mycology

6. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi – 199

7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers,New Delhi

8. Medical Parasitology – Ajit Damle

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-211]: MEDICAL MICROBIOLOGY PRACTICAL-II**

**PRACTICAL**:

1. Demonstration of common serological tests – Widal, VRDL, ELISA, Grams stain, Acid Fast staining, Stool exam for Helminthic ova.
2. Visit to hospital for demonstration of Biomedical waste mangement. Anaerobic culture methods.
3. Gram staining
4. Acid fast staining

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-205]: BASIC PATHOLOGY-II**

**UNIT-1st:**

**Hematology**:

1. **Introduction of Haematopoiesis**: Formation of Blood cells & Regulation of Haematopoiesis.
2. **Diagnostic methods:**

Hb estimation - Method, Colorimetric Method ,Chemical Method ,Clinical Importance ESR : Define , Principle , Procedure & clinical significance , Factors – Affecting ESR • Normal Values Haematocrit values: Estimation & their significance , RBC Indices ,Haemocytometery: Define All Blood cells count , their calculation & Clinical significance ,Rowmanowsky Stains : Staining procedures Counting Methods, Principle of staining Differential Leucocytes Count (DLC) , Normal & Abnormal Morphology of Red Blood cells and White Blood Cells.

**UNIT-2nd:**

**Blood Banking Technology:**

1. Introduction of ABO Blood group and Rh Blood group system , Other Blood group system: History of blood group system, inheritance of ABO & Rh blood group Ag.
2. Naturally occurring blood group Antibodies . Preparation of Monocolanal Ab.
3. Organization of Blood bank

**UNIT-3rd:**

1. **Anemias:**
2. Definition & classification of Anemia
3. Laboratory Diagnosis of -

Iron Deficiency Anemia

Megaloblastic Anemia

Post Hemorrhagic Anemia

Thalessemia Syndrome

1. **Hemorrhagic Disorders** – Definition and Classification
2. Haemostasis and coagulation Factors
3. Investigations and Lab Diagnosis
4. DIC
5. Platelet function test
6. Bleeding disorder

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-212]: BASIC PATHOLOGY PRACTICAL -II**

**PRACTICALS:**

1. Hb Estimation

2. PCV Estimation

3.ESR Estimation

4.WBC Count

5.RBC Count

6. Study of peripheral blood smear

**REFERENCE BOOKS**

1. Culling Histopathology techniques

2. Bancroft Histopathology techniques

3. Koss – cytology

4. Winifred greg – Diagnostic cytopathology

5. Orell – Cyto Pathology

6. Todd & Sanford Clinical Diagnosis by laboratory method

7. Dacie & Lewis – Practical Haematology

8. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed., J.P. Bros, New Delhi –1996)

9. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi – 1998

10.Sachdev K.N. Clinical Pathology and Bacteriology 8th Ed, J.P. Bros, New Delhi-1991.

11. Krishna - Text book of Pathology, Orient Longman PVT Ltd.

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**:**

**English Language and General Awareness-II {ELGA-102}**

A Communicative Approach To Learning English

Unit 1: Using English in Different Context

Unit 2: Set Expression and Idiomatic Response

Unit 3: Phrasal Verbs in Different Context

Unit 4: Use of Prefixes and Suffixes

Unit 5: Emphasis through Phrasing

Indian History

Unit 1: Pre- Maurya and Maurya Period

Unit 2: Gupta Empire to Mughal Empire

Unit 3: Europeans and Cultural Movement

Unit 4: Pre-Gandhian Era to the rise of Revolutionaries

Unit 5: Quit India Movement and India’s Independence

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**B. Sc Medical Laboratory Technology**

**BMLT {2nd Semester}**

**[BMLT-207]:**

**Instrumentation & Techniques**

**Unit I:**

* Introduction of Laboratory Management : Safety in the Laboratory , Laboratory Hazards, Biosafety Levels , Disposal of Medical Waste
* Laboratory Instrument: Microscope , Magnifications , Resolving power , NA, Component of microscope,
* Types of Microscope: Light Microscope, Bright field, Dark Field, Fluorescent, Phase Contrast, TEM, SEM.
* Micrometry: Calibrating an Eyepiece Micrometer

**Unit II:**

* Spectrophotometer & Colorimeter: Principal , Instrumentation, Handling & Application
* Flame Photometer and Atomic Absorption spectrophotometer : Principal & Instrumentation
* Quality Assurance: Preanalytical Factor ,Analytical Factor, Application of Quality Control.
* Quality Assurance chart : LJ chart, Cousom chart , and Normal distribution curve

**Unit III:**

* Chromatography : Methods of separation, Rf value , Classification of Chromatography ,
* Thin layer chromatography, Ion Exchange Chromatography , HPLC
* Electrophoresis: Method & Classification .Electrophoresis techniques for Hb.
* Western blotting: Introduction & Confirmatory test for HIV. Blotting techniques for DNA and RNA.