**SYLLABUS FOR MEDICAL LABORATORY TECHNICIAN**

**BMLT-2ND YEAR**

**3 YEAR PROGRAMME**

**PAPER-1**

**BMLT-201**

**Biochemistry**

**ANALYTICAL BIOCHEMISTRY AND METABOLISM:**

1. Colorimetry
2. Spectro photometry,
3. Flam photometry.
4. Atomic absorption spectroscopy.
5. Electrometric determination of Na and K+,
6. Chromatography,
7. Electrophoresis.
8. Introduction, properties and simple metabolism of carbohydrates, proteins and fats, nucleic acids and enzymes (Introduction, general properties).
9. Digestion and Absorption. Nutrition (Vitamins, Calories).
10. Radioimmunoassay (RIA) and ELISA.

**PAPER-2**

**BMLT-202**

**CELLULAR PATHOLOGY**

**Human Histology:**

I. Study of various body tissues: -

(a) Epithelial tissue.

(b) Connective tissue including bone and cartilage.

(c) Muscular tissue.

(d) Nervous tissue.

(e) Glands, epithetical and endocrine.

II. Histological Study of Various System of the Body:

(a) The circulatory system.

(b) The alimentary system.

(c) The digestive system including liver, pancreas and gall-bladder.

(d) The respiratory system.

(e) The urinary system.

(f) The system of endocrine glands.

(g) The reproductive system.

(h) Nerve endings and organs of special senses.

**Fundamentals of Applied Histology:**

1. Microscopy, working principle, maintenance and applications of various types of microscopes:

1. Dark ground microscope.

2. Polarizing microscope.

3. Phase contrast microscope.

4. Interference microscope.

5. U.V. light microscope.

1. Micrometry.

2. Metachromasis and metachromatic dyes.

3. Haematoxylin stain. Its importance in histology.

4. Carbohydrates and amyloid-special stains and procedures.

5. Connective tissues, trichrome staining and other special stain for muscle-fibres, elastic, reticulinfibres and collagen fibres.

6. Principles of metal impregnation techniques.

7. Demonstration and identification of minerals and pigments.

**CYTOLOGY:**

1. Stains cytologic preparation with special emphasis on MGG, PAPANICOLOU stains.

2. Special stains like PAS, Mucicarmine, Alcian blue, schmorl and acid phosphatase.

3. Cytologic screening and quality control in cytology laboratory.

**PAPER-3**

**BMLT-203**

**APPLIED HEMATOLOGY**

**1. Routine hematology tests:**

a) Determination of Hemoglobin and Hematocrit

b) Enumeration of RBC, WBC & Platelets

c) Absolute Eosinophil count

d) Reticulocyte count

f) Preparation and staining of blood film for morphological examination of red cells and differential count.

**2.Special Hematological tests:**

1. Sickling test
2. Osmotic fragility test
3. Determination HbF and HbA2
4. Hemoglobin Electrophoresis
5. Investigation of G6PD deficiency
6. Plasma haptoglobin and demonstration of hemosiderin in urine
7. Tests for Autoimmune hemolytic anaemia
8. Measurement of abnormal Hb pigments

**3.Hemostasis and Coagulation**

a) Normal hemostasis, mechanism of blood coagulation and normal fibrinolytic system

b) Collection of blood and anticoagulants used in coagulation studies

c) Investigation of hemostatic mechanism-BT, CT, whole blood coagulation time test, PT, PTT

d) Assay of clotting factors.

e)Platelet function tests

**4.Bone marrow biopsy study**

a) Needle aspiration and surgical biopsy technique

b) Preparation of smears and staining

c) Demonstration of LE cells

d) Quality control Reference

**PAPER-4**

**BMLT-204**

**MICROBIOLOGY**

**1.Identification of Bacteria:**

Micrococci, staphylococci, streptococci, pneumococci, coryne-bacteria, escherichia, klebsiella, enterobacter, proteus-providencia salmonella, ship Ella, Arizona, citrobacter, yersinia, pseudomonas, vibrio, haemophilus, mycobacterium, brucella, bordetella, bacillus, clostridia, anaerobic cocci, neisseria, treponema, borrelia, leptospira, mycoplasma, ricketssia, chlamydia, Tric agents.

**2. Pathogenic and Non-Pathogenic Fungi:**

Candida, Cryptococci, Dermatophytes, Sporotrichoums, Histoplasma, Blastomyces, Coccidiodes, Para-Coccidiodes, Dematiaceous fungi, Mycetoma, Actinomyces, Nocardia and common laboratory contamins. 3. Biochemical tests used for identification of bacteria and fungi. 4. Antimicrobial sensitivity testing and assay methods for body fluids. 5. Antimicrobial susceptibility testing for mycobacteria. 6. Preparation and Standardisation of antigens and antisera.

**2(B) VIROLOGY: Lectures:**

1. Different staining techniques used in Virology.

2. Use of Embryonated eggs in Clinical Virology.

3. Principles of animal cell culture and their use in Virology.

4. Use of common laboratory animals in viral diagnosis.

**Practical: :**

1**.**  Demonstration of staining procedures: Preparation of the following stains and demonstration of viral inclusion bodies: (a) Seller’s stain for Negri body demonstration. (b) Giemsastain for CMV and Herpes viral inclusions. 2. Preparation of reagents for serological tests: Phosphate buffered saline, veronal buffered saline, Alsever’s solution, Dextrose gelatin, veronal buffer and Tris buffer.

3. Principles and performance of viral Haemagglutination and Haemagglutination inhibition test.

4. Demonstration of Haemadsorption test, (misprint)

5. Collection, titration and preservation of gunea pig (misprint).

6. Demonstration of complement fixation test.

7. Demonstration of immunofluorescene test and (misprint) test.

8.Demonstration of ELISA for\_\_\_\_\_\_ detection.