**SYLLABUS FOR DIMLOMA IN MEDICAL LABORATORY TECHNICIAN (DMLT) 2ND YEAR**

**TWO YEAR PROGRAMME**

**PAPER-I**

**MICROBIOLOGY**

**DMLT-201**

**INTRODUCTION TO MEDICAL MICROBIOLOGY**:-

DEFINITION, HISTORY, HOST-MICROBE RELATIONSHIP.

1. **SAFETY MEASURES IN CLINICAL MICROBIOLOGY**
2. **GLASSWARE USED IN CLINICAL MICROBIOLOGY LABORATORY:-** INTRODUCTION, CARE AND HANDLING OF GLASSWARE, CLEANING OF GLASSWARE.
3. **EQUIPMENTS USED IN CLINICAL MICROBIOLOGY LABORATORY**:- INTRODUCTION, CARE & MAINTENANCE.
4. **MICROSCOPY** :- INTRODUCTION AND HISTORY, TYPES OF MICROSCOPES:- (a) LIGHT MICROSCOPE, (b) DGI, (c) FLUROSCENT, (d) PHASE CONTRAST, (e) ELECTRON MICROSCOPE:- (i) TRANSMISSION, (ii) SCANNING., PRINCIPLES OF OPERATIONAL MECHANISMS OF VARIOUS TYPES OF MICROSCOPES.
5. **STERILIZATION :-** DEFINITION, TYPES AND PRINCIPLES OF STERILIZATION METHODS:- (a) HEAT(DRY HEAT, MOIST HEAT WITH SPECIAL REFERENCE TO AUTOCLAVE), (b) RADIATION, (c) FILTRATION., EFFICIENCY TESTING TO VARIOUS STERILIZERS.
6. **ANTISEPTICS AND DISINFECTANTS:-** DEFINITION, TYPES AND PROPERTIES, MODE OF ACTION, USES OF VARIOUS DISINFECTANTS, PRECAUTIONS WHILE USING THE DISINFECTANTS, QUALITIES OF A GOOD DISINFECTANTS, TESTING EFFICIENCY OF VARIOUS DISINFECTANTS.
7. **BIOMEDICAL WASTE MANAGEMENT IN A MICROBIOLOGY LABORATORY:-** TYPES OF THE WASTE GENERATED, SEGREGATION, TREATMENT, DISPOSAL.
8. **GENERAL CHARACTERISTICS & CLASSIFICATION OF MICROBES:-** (BACTERIA & FUNGI):- CLASSIFICATION OF MICROBES WITH SPECIAL REFERENCE TO PROKARYOTES & EUKARYOTES, MORPHOLOGICAL CLASSIFICATION OF BACTERIA, BACTERIAL ANATOMY(BACTERIAL CELL STRUCTURES)
9. **GROWTH AND NUTRITION OF MICROBES:-** GENERAL NUTRITIONAL & OTHER REQUIREMENTS OF THE BACTERIA, NUTRITIONAL TYPES OF THE BACTERIA AUTOTROPHS, HETEROTROPHS, PHOTOTROPHS, CHEMOTROPHS, SAPROTROPHS,ITHOTROPHS & ORGANOTROPHS, PHOTOAUTOTROPHS,CHEMOHETEROTROPHS, PHOTOORGANOTROPHIC, HETEROTROPHS, CHEMOLITHOTROPHIC AUTOTROPHS MIXOTROPHIC., PHYSICAL CONDITIONS REQUIRED FOR GROWTH, NORMAL GROWTH CYCLE OF BACTERIA(GROWTH CURVE), TYPES OF MICROBIAL CULTURES: SYNCHRONOUS, STATIC, CONTINUOUS CULTURE.

**PAPER-2**

**SUBJECT-BIOCHEMISTRY**

**DMLT-202**

1. **TERMS:-**NORMAL SOLUTION, MOLAR SOLUTION, SATURATED SOLUTION, UNSATURATED SOLUTION AND BUFFER SOLUTION.
2. **PREPARATION OF SOLUTION:**- NORMAL, MOLAR, SATURATED, UNSATURATED AND BUFFER.
3. **CLEARING:-**GLASS WARES.
4. **PIPPETS:**- TYPES AND USE OF PIPPETS.
5. **PH:**- DETERMINATION OF UNKNOWN.
6. **CALORIMETER:**- TYPES COMPONENTS USE AND MAINTENANCE.
7. **DISTILLATION:**- WATER
8. **PROTIENS:**- AMINO ACIDS, ESSENTIAL AMMINO, PROTIENS, DENATURIATION OF PROTIENS, METABOLISM FORMATION OF UREA, CREATININE etc. DETERMINATION OF PLASMA PROTIENS (ALBUMEN, GLOBULIN, FIBRINOGEN) BLOOD UREA, URIC ACID & CREATININE.
9. **NUCLEIC ACIDS:-** DNA, RNA, AND THEIR IMPORTNACE.
10. **CARBOHYDRATES:**- CLASIIFICATION, PROPERTIES METABOLISM, DEIFNITION OF GLYCOLYSIS, GLYCOGENELYSIS,CLUCONEGESIS AND HORMONAL REGULATION OF BLOOD SUGAR. DIABETES MELLITUS KETOSIS, GLYCOURIA, WATER AND MINERAL METABOLISM, DETERMINATION OF BLOOD GLUCOSE, GTT & INSULIN TOLERANCE TEST.
11. **LIPIDS:-** DEFINITION, CLASSIFICATION, STERIODS, METABOLISM, TRIGLYCERIDES, CHOLESTROAL, PLASMALIPOOPROTIENS-KETONE DODIES AND KETOSURIA. DETERMINATION OF SERUM CHOLESTROL, HDL, LDL, VLDL & TRIGLYCERIDES.
12. **ELECTROLYTES IN BODY FLUIDS:**- SODIUM, POTASSIUM,CLACIUM, PHOSPHORUS & CHLORIDES-DETERMINATION & CLINICAL SIGNIFICANCE.
13. **ENZYMES:**- ASSAYS IN CLINICAL LABORATORIES:- (a) CREATINE KINASE, (b) PHOSPHATASE(ACID & ALKALINE), (c) TRANSAMINASE(SGOT & SGPT), (d) AMYLASE.
14. **JAUNDICE:**- DEFINITION AND ITS TYPES, ESTIMATION OF SERUM BILIRUBIN (TOTAL DIRECT & INDIRECT) AND ITS MEDICAL IMPORTANT.
15. **LIVER FUNCTION TEST (LFT):**- AND SERUM BILIRUBIN ESTIMATION (TOTAL DIRECT & INDIRECT)AND ITS MEDICAL IMPORTANT.
16. **RENAL FUNCTION TEST (RFT).**
17. **HORMONES:-**DEFINITION & FUNCTIONS OF SOME IMPORTANT HORMONES. RADIOISOMETRIC ASSAYS FOR T3, T4 & TSH.

**PAPER-3**

**SUBJECT : LABORATORY MANAGEMENT**

**DMLT-203**

1. **LABORATORY PLANNING:-**LABORATORY PRINCIPLES, GOALS, OPERATIONAL DATA, MARKET DATA, MARKET,POTENTIAL, HOSPITAL/LABORATORY, COMPETITIONS, LABORATORY TRENDS, GUIDING, PRINCIPLES FOR PLANNING HOSPITAL LABORATORY SERVICES PLANNING FOR A BASIC HEALTH LABORATORY.
2. **LABORATORY ORGANIZATION:-**PRINCIPLE COMPONENTS AND FUNCTIONS OF A LABORATORY, STAFFING THE LABORATORY, JOB, DESCRIPTION SPECIFICATIONS, WORK SCHEDULE,PERSONNEL RE-ARRANGEMENT AND WORK LOAD ASSESSMENT.
3. **CARE OF LABORATORY GLASSWARE EQUIPMENT AND CHEMICALS:-** CARE AND CLEANING OF GLASSWARE, CARE OF EQUIPMENT AND APPURETUS, LABORATORY, THEIR, PROPER USE AND CARE, LABORATORY, CHEMICALS. THEY’RE PROPER USE AND CARE. LABELING.
4. **SPECIMEN HANDLING:-**COLLECTION TECHNIQUES AND CONTAINERS, TYPES OF SPECIMENS, ENTRY, SPECIMEN TRANSPORT, TRANSFERENCE DISTRIBUTION AND RE-ASSIGNMENT DISPOSAL, PRESERVATION OF SPECIMEN.
5. **LABORATORY SAFETY: -** LABORATORY HAZURDS, SAFETY, FIRST AID.
6. **SAFETY MEASURES:-** MECHANICAL, ELECTRICAL, CHEMICAL, BIOLOGICAL, REDUCTIVE
7. **COMMNICATION:-** PERSONNEL DEVELOPMENT AND RELATIONS, REQUEST/REPORT FROMS
8. **QUALITY CONTROL:-** NON-ANALYTICAL FUNCTIONS, ANALYTICAL FUNCTIONS
9. **MATERIAL MANAGEMENT:-** PROCUREMENT IDENTIFICATIONS AND CORRESPONDENCE OF MATERIALS WITH SOURCES. INVENTORY, CONTROL AND ANALYSIS INSPECTION AND STORAGE, RECORDS AND REPORTS, COST CONTROL, PURCHASE AND UTILIZATION OF SUPPLIES.

NATIONAL HEALTH PROGRAMMES.

**PAPER-4**

**SUBJECT : HAEMATOLOGY & BLOOD**

**DMLT-204**

1. **INTRODUCTION TO HAEMATOLOGY:** (A) DEFINITION, (B) IMPORTANCE, (C) IMPORTANT EQUIPMENT USED.
2. LABORATORY ORGANIZATION AND MAINTENANCE
3. INTRODUCTION TO BLOOD, ITS COMPOSITION, FUNCTION AND NORMAL CELLULAR COMPONENTS.
4. **BASIC FORMATION OF BLOOD:** (A) ERYTHROPOIESIS, (B) LEUCOPOIESIS, (C) THROMBOPOIESIS.
5. COLLECTION AND PRESERVATION BLOOD SAMPLE FOR VARIOUS HAEMATOLOGICAL ESTIMATION.
6. **HAEMOGLOBIN:** DEFINITION AND TYPES, NORMAL VALUES, SYNTHESIS AND BREAKDOWN, HAEMOGLOBIN ESTIMATION TECHNIQUES, PRINCIPLES & PROCEDURES FOR HB ESTIMATION, ERRORS INVOLVED AND MEANS TO MINIMIZE ERRORS FOR HB ESTIMATION.
7. **TOTAL LEUCOCYTES COUNT (TLC):** NORMAL VALUES, CLINICAL SIGNIFICANCE, METHOD OF ESTIMATION, SOURCE OF ERRORS.
8. **DIFFERENTIAL LEUCOCYTES COUNT(DLC):** NORMAL VALUES, CLINICAL SIGNIFICANCE, SOURCES OF ERRORS AND MEANS TO MINIMIZE THEM
9. **ERYTHROCYTE SEDIMENTATION RATE(ESR)**: NORMAL VALUES, DEFINITION, PRINCIPLE AND PROCEDURE TO DETERMINE ESR, FACTORS THEIR MINIMIZATION.
10. **PACKED CELL VOLUME/HAEMATOCRIT VALUE:** NORMAL VALUES, ESTIMATION BY MACRO AND MICRO METHOD, MERITS AND DEMERITS OF ESTIMATION METHOD, FACTORS INFLUENCING PCV, CLINICAL SIGNIFICANCE.
11. **RED CELL INDICES(RCI):** DEFINITION,PROCEDURE AND GENERAL FORMULA INFLUENCING ESR AND CLINICAL SIGNIFICANCE, ERRORS INCLUDED AND
12. FOR CALCULATING INDICES, CLINICAL SIGNIFICANCE, NORMAL VALUE, NUMERICAL PROBLEMS RELATED TO RCI.
13. **ABSOLUTE EOSINOPHIL COUNT:** PRINCIPLE AND PROCEDURE FOR COUNTING AEC, CLINICAL SIGNIFCANCE, NORMAL VALUE, RISK OF ERROR INVOLVED IF ANY.
14. **RETICULOCYTE COUNT:** PRINCIPLE AND PROCEDURE, CLINICAL SIGNIFICANCE, NORMAL VALUE, RISK OF ERROR INVOLVED IF ANY.
15. **PLATELETS COUNT:** NORMAL VALUES, PROCEDURE AND ESTIMATION, CLINICAL SIGNIFICANCE, ERRORS AND RE-CORRECTION.
16. **PREPARATION OF BLOOD FILMS:** TYPES, METHODS OF PREPARATION.
17. **ROUTINE STAINING TECHNIQUES IN HAEMATOLOGY:** GIEMSA STAN, LEISHMAN STAIN, PRINCIPLE, COMPOSITION, PREPARATION OF STAINING REAGENTS AND PROCEDURE.
18. BLOOD GROUP SYSTEM AND BLOOD GROUP INCOMPATIBILITY ABO, RH SYSTEMS, CROSS, MATCHING TEST IN EMERGENCY.
19. **BLOOD BANKING PREPARATION:-** BLOOD COLLECTION PROCEDURE, TRANSPORT AND STORAGE. PREPARATION AND USE OF WHOLE BLOOD AND BLOOD COMPONENTS-WASHED RED CELLS, PLASMA PREPARATION, ETC.
20. **QUALITY CONTROL IN BLOOD BANKS:-** SPECIMEN COLLECTION, RISK ASSESSMENT FOR AIDS AND SERUM HEPATITIS.