



SINGHANIA UNIVERSITY

(Established by the Govt. of Rajasthan & recognized as per section 2f of UGC Act, 1956)
Pacheri Bari, Distt. Jhunjhunu (Rajasthan) - 333515

| | | | |
|----------------------|------|-----|--|
| 1 st YEAR | BMLT | 101 | HAEMOTOLOGY AND BLOOD BANKING |
| | BMLT | 102 | HUMAN ANATOMY, PHYSIOLOGY AND CLINICAL BIOCHEMISTRY |
| | BMLT | 103 | INTRODUCTION TO CLINICAL PATHOLOGY & HISTO PATHOLOGY |
| | BMLT | 104 | LAB INSTRUMENTS AND ETHICS[BMLT] |
| | BMLT | 105 | MICROBIOLOGY & PATHOLOGY |
| | BMLT | 106 | PRACTICALS |

| | | | |
|----------------------|------|-----|---|
| 2 nd YEAR | BMLT | 201 | ADVANCED BIOCHEMISTRY AND BIOCHEMICAL TECHNIQUES |
| | BMLT | 202 | ADVANCED HISTOPATHOLOGY AND CYTOPATHOLOGY TECHNIQUES |
| | BMLT | 203 | ADVANCED MICROBIOLOGY AND SEROLOGY |
| | BMLT | 204 | COAGULATION & TRANSFUSION MEDICINE |
| | BMLT | 205 | PRACTICAL |
| | BMLT | 206 | VIROLOGY AND MYCOLOGY |

| | | | |
|----------------------|------|-----|---|
| 3 rd YEAR | BMLT | 301 | IMMUNO HAEMATOLOGY AND TRANSFUSION MEDICINE |
| | BMLT | 302 | ADVANCED VIROLOGY AND MYCOLOGY |
| | BMLT | 303 | ADVANCED LAB INSTRUMENTATION |
| | BMLT | 304 | PRACTICAL MLTL BSC LAB III |
| | BMLT | 305 | PRACTICAL MLTL BSC LAB IV |



BMLT

101

HAEMATOLOGY AND BLOOD BANKING

UNIT - 01

SPECIMEN COLLECTION AND LABORATORY PREPARATIONS IN HEMATOLOGY.
ROUTINE HEMATOLOGICAL TEST, HB ESTIMATION, TOTAL LEUKOCYTE ESTIMATION

UNIT - 02

TOTAL ERYTHROCYTE ESTIMATION, DIFFERENTIAL LEUCOCYTE COUNT, ESR, PACKED CELL VOLUME

UNIT - 03

RETICULOCY COUNT, PLATELET COUNT, ABSOLUTE EOSINOPHIL COUNT, ARNETH COUNT

UNIT - 04

SCHILLING COUNT, RED CELL INDICES, PERIPHERY CELL - MORPHOLOGY

UNIT - 05

SPECIAL HEMATOLOGICAL TEST. FOETAL HEMOGLOBIN ESTIMATION, FOETAL RED CELL ESTIMATIONS

UNIT - 06

LUPUS ERYTHROCYTE CELL PREPARATION, OSMOTIC FRAGILITY TEST

UNIT - 07

HEINZ BODIES PREPARATION, BONE MARROW SMEAR PREPARATIONS, STUDY OF BLOOD PARASITES

UNIT - 08

INTERPRETATION OF LAB FINDINGS IN HEMATOLOGY ANEMIA, LEUKEMIA ABNORMAL RBC AND WBC MORPHOLOGY.

UNIT - 09

INTRODUCTION TO HOMEOSTASIS, COAGULATION AND BLEEDING DISORDERS.



UNIT - 10

CLOTTING AND BLEEDING TIME DETERMINATIONS, COAGULATIONS

MECHANISMS, COAGULATION STUDIES.

UNIT - 11

PRINCIPLES OF IMMUNO HAEMETROLOGY, CLINICAL SIGNIFICANCE OF BLOOD TRANSFUSIONS. COLLECTIONS AND PROCESSING'S OF BLOOD FOR TRANSFUSION ROUTINE LAB PROCEDURES IN BLOOD BANK

UNIT - 12

ABO SYSTEM, RH SYSTEM SUB GROUPING, COMPATIBILITY TESTING, COOMBS TESTING, ANTIBODY TITRATION AND D` TESTING



BMLT

102

HUMAN ANATOMY, PHYSIOLOGY AND CLINICAL BIOCHEMISTRY

UNIT - 01

HUMAN ANATOMY - PHYSIOLOGY - CELL STRUCTURE - DIVISION & FUNCTION –
CELL ORGANELLES - TISSUE - TYPES OF TISSUES AND THEIR FUNCTIONS –
SKELETAL SYSTEM.

UNIT - 02

RESPIRATORY SYSTEM - BRIEF DESCRIPTION OF LARYNX - BRONCHI - LUNGS -
CARDIOVASCULAR SYSTEM - ANATOMY AND PHYSIOLOGY OF HEART -
ARTERIES AND VEINS - CIRCULATION - SYSTEMATIC AND PULMONARY (IN
BRIEF) - BRIEF REVIEW OF CHAMBERS

UNIT - 03

URINARY SYSTEM - STRUCTURE AND FUNCTION OF THE KIDNEY - UTERUS -
BLADDER - URETHRA AND NEPHRON GIVE SPECIAL EMPHASIS ON FORMATION
OF URINE -PHYSIOLOGY AND ANATOMY OF MALE AND FEMALE
REPRODUCTIVE ORGANS

UNIT - 04

ENDOCRINE - PITUITARY - THYROID - PARATHYROID - THYMUS - ADRENALS
AND PANCREAS

UNIT - 05

CENTRAL NERVOUS SYSTEM - BRAIN - SPINAL CORD AND MENINGES EXPLAIN
WITH ITS FUNCTIONS

UNIT - 06

SKINS - STRUCTURE AND FUNCTIONS - STUDY AND GIVE SMALL PROJECT ON
BONES AND CARTILAGE HLA SYSTEM.



UNIT - 07

DIGESTIVE SYSTEM - PHYSIOLOGY AND ANATOMY OF MOUTH - STOMACH -
INTESTINE - ABSORPTION OF FOOD AND ITS EXCRETION - ROLE OF BILE IN
DIGESTION AND EXCRETION - LIVER FUNCTION AND A BRIEF DESCRIPTION OF
LIVER AND BILIARY TREE.

UNIT - 08

CLINICAL BIOCHEMISTRY - CARBOHYDRATES - CARBOHYDRATES
METABOLISM - GLYCOGENESIS - GLYCOLYSIS - REGULATION OF BLOOD
GLUCOSE CONCENTRATION - DIABETES MELLITUS - GLYCOSURIA - GLUCOSE
TOLERANCE TEST

UNIT - 09

LIPIDS - INTRODUCTION - SIMPLE LIPIDS - COMPOUND LIPIDS - DERIVED LIPIDS
- ESSENTIAL FATTY ACIDS - KETONE BODIES FORMATION.

UNIT - 10

PROTEINS - DEFINITION - CLASSIFICATION - STRUCTURE OF PROTEINS -
DENATURATION OF PROTEINS - IMPORTANT TESTS OF PROTEINS -
ESTIMATION OF PROTEINS - ALBUMIN - GLOBULIN - GLYCOPROTEINS -
PROTEIN ESTIMATION - ESTIMATION OF TOTAL PROTEINS - ALBUMIN &
GLOBULIN - ESTIMATION OF BLOOD UREA - SERUM CREATININE ESTIMATION
SERUM URIC ACID ESTIMATION

UNIT - 11

LIVER FUNCTION TESTS - SERUM BILIRUBIN ESTIMATION - SERUM PROTEIN
ESTIMATION.

UNIT - 12

ENZYMOLGY - INTRODUCTION - DEFINITION & CLASSIFICATION - PROPERTIES
-FACTORS INFLUENCING -ACTION OF ENZYMES - DIAGNOSTIC VALUE OF
SERUM ENZYMES - MECHANISM OF ENZYME ACTION.



UNIT - 01

MICROBIOLOGY AND PATHOLOGY - INTRODUCTION - DEFINITION - CLASSIFICATION - CLINICAL IMPORTANCE - NORMAL OCULAR FLORA - DEFINITION – CLINICAL IMPORTANCE.

UNIT - 02

CLINICAL PATHOLOGY AND HISTOLOGY - COMPONENTS OF BLOOD AND THEIR FUNCTIONS - HEMATOPOEITIC SYSTEM OF BODY - SPECIMEN COLLECTION FOR LIEMATOLOGICAL STUDIES.

UNIT - 03

HISTOPATHOLOGY OF LIVER - KIDNEY - ADRENAL - OVARY - TESTIES

UNIT - 04

OCCULAR PARASITOLOGY - INTRODUCTION - DEFINITION - CLASSIFICATION - ACANTHAMEOBA - TOXOPLASMA - TOXOCARA - FILARIA - CYSTICERCUS - ECHINOCOCCUS - PHTHIRUS - COMMON PARASITES - CLINICAL IMPORTANCE - DIAGNOSIS

UNIT - 05

DETERMINATION OF HEMOGLOBIN CONTENT - TOTAL RBC - WBC AND PLATELET COUNT - EST - CALCULATION OF RED BLOOD CELL INDICES MCV - VCH ETC.

UNIT - 06

EXAMINATION OF BLOOD FOR PARASITES - PERIPHERAL BLOOD SMEAR EXAMINATION - IDENTIFICATION OF ANAEMIAS - FIBRINOLYSIS - BLEEDING TIME - CLOTTING TIME – PT ETC

UNIT - 07

ROUTINE EXAMINATION OF URINE - PHYSICAL - CHEMICAL AND MICROSCOPIC EXAMINATION OF URINE - RAPID CHEMICAL TESTS FOR URINE.



UNIT - 08

MICROSCOPIC EXAMINATION OF SEMEN - SPECIMEN COLLECTION - LAB INVESTIGATIONS - EXAMINATION FOR PRESENCE OF SEMEN - SPERM MOTILITY AND SPERM COUNT.

UNIT - 09

COLLECTION OF FAECAL SPECIMEN FLUID - PHYSICAL - CHEMICAL AND MICROSCOPIC EXAMINATION FOR STOOL - CSF EXAMINATION - SEROUS FLUID - SYNOVIAL FLUID - GASTRIC JUICE, ETC.

UNIT - 10

CLINICAL SIGNIFICANCE OF HISTOPATHOLOGY - STUDY OF COMMON INSTRUMENTS IN HISTOLOGY AND THEIR OPERATION

UNIT - 11

TISSUE PROCESSING - FUNDAMENTALS OF MICROSCOPY.

UNIT - 12

STAINING TECHNIQUES - METHOD OF PREPARING STAINS & FIXATIVES



BMLT

104

LAB INSTRUMENTS AND ETHICS[BMLT]

UNIT - 01

LAB INSTRUMENTS - INTRODUCTION TO LABORATORY EQUIPMENTS AND BASIC LABORATORY OPERATIONS - BASIC CHEMICAL / REAGENTS - GLASSWARE.

UNIT - 02

MICROSCOPES - INTRODUCTION - DEFINITION - CLASSIFICATION - METHODS OF MICROSCOPY - LIGHT MICROSCOPE - COMPOUND MICROSCOPE - PHASE CONTRAST MICROSCOPE - FLUORESCENT MICROSCOPE - ELECTRON MICROSCOPE AND THEIR APPLICATIONS

UNIT - 03

SOFTWARE FOR LABORATORIES - ELECTRONIC TRANSFORMERS - INCUBATOR - OVEN - WATER BATH.

UNIT - 04

EQUIPMENT FOR HIS TO PATHOLOGY - CENTRIFUGES - DENSITOMETRY.

UNIT - 05

DISPOSABLE SYRINGE AND DR. SNOOD'S MULTI PURPOSE UNIVERSAL CULTURE CONTAINERS - DIPSTICKS FOR URINE - GLUCOSTIX - GLUCOMETER

UNIT - 06

BLOOD GROUP SERA - ANTIS ERA AND BLOOD BANK PRODUCTION - PREGNANCY TEST KITS

UNIT - 07

STERILIZATION EQUIPMENTS - PHOTO COLORIMETERS - SPECTROPHOTOMETER METERS



UNIT - 08

SERUM AUTO ANALYSIS - RANDOM ACROSS BATCH ANALYSIS - HEMATOLOGY COUNTERS.

UNIT - 09

ELECTROLYTE CONTROLS - ELECTROLYTE ANALYSIS - COAGULAMETRY - BIO CHEMICAL TESTS - ELISA KIT / SERO IMMUNOLOGY.

UNIT - 10

LABORATORY ETHICS - ORGANIZATION OF CLINICAL LABORATORY AND ROLE OF MEDICAL LAB TECHNICIAN - SAFETY REGULATIONS - QUALITY CONTROL OF LAB FINDINGS - ETHICAL ISSUES IN LABORATORY.

UNIT - 11

LABORATORY MANAGEMENT - FIRST AID AND CLINICAL LAB RECORDS – ORGANIZATION OF LAB - INTRODUCTION TO LAB EQUIPMENTS.

UNIT - 12

GENERAL COMMENTS AND SPECIMEN COLLECTION - UNITS OF MEASUREMENTS - PREPARATION OF REASONS - SOLUTIONS AND LAB CALCULATIONS.



BMLT

105

MICROBIOLOGY & PATHOLOGY

UNIT - 01

MICROBIOLOGY AND PARASITOLOGY - INTRODUCTION - DEFINITION - CLASSIFICATION - CLINICAL IMPORTANCE - OCULAR MICROBIOLOGY - NORMAL OCULAR FLORA - DEFINITION - CLINICAL IMPORTANCE - BASIC LABORATORY TECHNIQUES – COLLECTION OF SPECIMENS - CONJUNCTIVAL SWAB - LACRIMAL SAC - SCRAPINGS FROM CORNEAL ULCER - AC, VITREOUS TAPPINGS - ANALYSIS

UNIT - 02

FIXING OF SLIDES - MICROSCOPY - STAINING - POTASSIUM HYDROXIDE MOUNT - GRAM'S STAINING - GIEMSA STAINING - CULTURE

UNIT - 03

BACTERIOLOGY - DEFINITION - CLASSIFICATION - GRAM POSITIVE COCCI – COMMON ORGANISMS - STAPHYLOCOCCI - STREPTOCOCCI - PNEUMOCOCCI – CLINICAL IMPORTANCE - DIAGNOSIS - GRAM POSITIVE BACILLI - COMMON ORGANISMS - CORYNEBACTERIUM DIPHTHERIAE - C.XEROSIS.

UNIT - 04

CLINICAL - IMPORTANCE - DIAGNOSIS - GRAM NEGATIVE COCCI - COMMON ORGANISMS - GONOCOCCI - MENINGOCOCCI - CLINICAL IMPORTANCE - DIAGNOSIS – GRAM NEGATIVE BACILLI - COMMON ORGANISMS - ENTEROBACTERIA, PSEUDOMONAS - MORAXELLA, HAEMOPHILUS - CLINICAL IMPORTANCE - DIAGNOSIS - MYCOBACTERIA - COMMON ORGANISMS - M.TUBERCULOSIS, M.LEPRAE.

UNIT - 05

CLINICAL IMPORTANCE - DIAGNOSIS - SPIROCHETES - COMMON ORGANISMS -



TREPONEMA PALLIDUM - LEPTOSPIRA - CLINICAL IMPORTANCE - DIAGNOSIS - CHLAMYDIAE – COMMON ORGANISMS - TRIC, LGV.

UNIT - 06

CLINICAL IMPORTANCE - DIAGNOSIS - OCULAR VIROLOGY - DEFINITION - CLASSIFICATION - COMMON VIRUSES - POX - HERPES - ADENO - PICORNA - RUBELLA -RETROVIRUSES.

UNIT - 07

CLINICAL IMPORTANCE - DIAGNOSIS - OCULAR PARASITOLOGY - DEFINITION - CLASSIFICATION - ACANTHAMEOBA - TOXOPLASMA - TOXOCARA - FILARIA - CYSTICERCUS - ECHINOCOCCUS - PHTHIRUS - COMMON PARASITES

UNIT - 08

CLINICAL IMPORTANCE - DIAGNOSIS - OCULAR MYCOLOGY - DEFINITION - CLASSIFICATION - COMMON FUNGI - FUSARIUM, ASPERGILLUS, MUCOR, CANDIDA, -RHINOSPORIDIUM, HISTOPLASMA.

UNIT - 09

CLINICAL IMPORTANCE - DIAGNOSIS - OCULAR IMMUNOLOGY - DEFINITION – CLINICAL IMPORTANCE - TYPE 1, TYPE 2, TYPE 3, TYPE 4 REACTION - STERILIZATION AND DISINFECTION - STERILIZATION - DEFINITION - METHODS - HEAT (DRY, MOIST HEAT), IONISING RADIATION - FILTRATION - STERILANT GASES - STERILANT LIQUIDS -DISINFECTION - DEFINITION - METHODS - HEAT - UV RADIATION - CHEMICAL AGENTS -FILTRATION - GASES - CHOICES OF METHODS.

UNIT - 10

GENERAL PATHOLOGY - NORMAL CELL - INJURY - INFLAMMATION - VASCULAR COMPONENT - CELLULAR COMPONENT - HEALING AND REPAIR - VASCULAR COMPONENT - CELLULAR COMPONENT - HYPER SENSITIVITY REACTIONS - TUMOURS.



UNIT - 11

OCULAR PATHOLOGY - EYE LIDS - CHALAZION - HORDEOLUM INTERNUM –
HORDEOLUM - EXTERNUM - CONJUNCTIVA - CONJUNCTIVITIS - CORNEA.

UNIT - 12

ULCERS - KERATOCONNUS - LENS - PATHOLOGY OF CATARACT - LENS
INDUCED

GLAUCOMA & UVEITIS - TUMOURS - RETINOBLASTOMA - MALIGNANT
MELANOMA

TUMOURS - ORBITAL TUMOURS & PSEUDO TUMOURS- SQUAMOUS CELL
CARCINOMA -LACRIMAL GLAND.



BMLT

106

PRACTICALS

UNIT - 01

1. STUDY OF INSTRUMENTS IN ANATOMY, PHYSIOLOGY, BIOCHEMISTRY, MICROBIOLOGY AND PATHOLOGY LABS AND ITS ETHICS.
2. STUDY OF HUMAN ANATOMY, BONE, JOINTS, MUSCULAR SYSTEM, LYMPHATIC SYSTEM, RESPIRATORY SYSTEM, DIGESTIVE SYSTEM, URINARY SYSTEM.
3. STUDY OF ROUTINE HAEMATOLOGICAL EXPERIMENTS
4. STUDY OF ROUTINE BIOCHEMICAL AND URINE ANALYSIS
5. STUDY OF STOOL EXAMINATION
6. STUDY OF VARIOUS MICRO ORGANISMS.
7. STUDY OF PREPARATION OF VARIOUS CULTURE MEDIA.
8. STUDY OF VARIOUS STAINING METHODS.
9. STUDY OF VARIOUS TECHNIQUE IN HISTO PATHOLOGICAL AND CYTOPATHOLOGICAL TEST.
10. STUDY ABOUT CULTURE AND FUNCTIONS TESTS OF PUS, URINE, STOOL AND SEMINAL FLUID.
11. STUDY ABOUT THE VARIOUS TESTS IS CLINICAL AND HISTOPATHOLOGY.
12. STUDY ABOUT BLOOD BANK AND BLOOD TRANSFUSION.

RECORD WORK AND EVALUATION:

1. ANATOMY & PHYSIOLOGY LAB POSTING
2. BIOCHEMISTRY LAB POSTING
3. BLOOD BANK POSTING
4. PATHOLOGY & MICROBIOLOGY LAB POSTING
5. ASSIGNMENT PRESENTATION
6. CLINICAL LAB POSTING.



SCHEME OF PRACTICAL EXAM:

S.NO NAME OF EXAM MARK DURATION

1. SPOTTER EXAM 10X2=20 30 MINUTES
2. HAEMATOLOGY (OR) BIOCHEMISTRY PRACTICAL 30 90 MINUTES
PROCEDURE WRITING -10
PRACTICAL SKILL - 10
VIVA VOICE - 10
3. MICROBIOLOGY(OR)PATHOLOGY PRACTICAL 20 60 MINUTES
PROCEDURE WRITING -10
PRACTICAL SKILL AND VIVA VOICE - 10
4. RECORD NOTE 5

FOR RECORD WORK: EVERY STUDENT SHOULD BE DONE ALL THE HAEMATOLOGY, BIOCHEMISTRY PATHOLOGY AND MICROBIOLOGY PRACTICALS GIVEN IN SYLLABUS ATLEAST ON TIME DURING THE PERIOD OF COURSE. AFTER THAT WRITE IN RECORD, WORK AND SUBMITTED BEFORE THE UNIVERSITY EXAMINATIONS.



| | | |
|------|-----|--|
| BMLT | 201 | ADVANCED BIOCHEMISTRY AND BIOCHEMICAL TECHNIQUES |
|------|-----|--|

UNIT - 01

RADIO ISOTOPES AND THEIR USE IN BIOCHEMISTRY - OSMOSIS - DIALYSIS – SURFACE TENSION.

UNIT - 02

URINE ANALYSIS (QUALITATIVE) FOR SUGAR - PROTEINS - BILE PIGMENTS – KETONE BODIES - PORPHOBILINGOGEN - FAECAL OCCULT BLOOD - BILE SALTS.

UNIT - 03

COLLECTION AND RECORDING OF BIOLOGICAL SPECIMENS - SEPARATION OF SERUM - PLASMA - PRESERVATION AND DISPOSABLE OF BIOLOGICAL SAMPLES - MATERIALS.

UNIT - 04

BASIC STATISTICS (MEAN - SD - CV - NORMAL DISTRIBUTION - PROBABILITY).

UNIT - 05

VOLUMETRIC ANALYSIS - PREPARATION OF STANDARD ACID AND BASE SOLUTION - CHLORIDE ESTIMATION.

UNIT - 06

BIOCHEMISTRY OF CARBOHYDRATE - PROTEIN - LIPIDS AND VITAMINS.

UNIT - 07

CARBOHYDRATES - METABOLISM - GLYCOGENESIS - GLYCOLYSIS - REGULATION OF BLOOD GLUCOSE CONCENTRATION - DIABETES - MELLITUS - GLYCOSURIA – GLUCOSE TOLERANCE TEST.



UNIT - 08

LIPIDS - INTRODUCTION - SIMPLE LIPIDS - COMPOUND LIPIDS - DERIVED LIPIDS
-ESSENTIAL FATTY ACIDS - KETONE BODIES FORMATION.

UNIT - 09

PROTEINS - DEFINITION - CLASSIFICATION - STRUCTURE OF PROTEINS -
DENATURATION OF PROTEINS - IMPORTANT TESTS OF PROTEINS -
ESTIMATION OF PROTEINS - ALBUMIN - GLOBULIN - GLYCOPROTEINS -
PROTEIN ESTIMATION -ESTIMATION OF TOTAL PROTEIN.

UNIT - 10

ALBUMIN & GLOBULIN - ESTIMATION OF BLOOD UREA - SERUM CREATININE
ESTIMATION - SERUM URIC ACID ESTIMATION

UNIT - 11

LIVER FUNCTION TESTS - SERUM BILIRUBIN ESTIMATION - SERUM PROTEIN
ESTIMATION.

UNIT - 12

ENZYMOLGY - INTRODUCTION - DEFINITION & CLASSIFICATION - PROPERTIES
-FACTORS INFLUENCING ACTION OF ENZYMES - DIAGNOSTIC VALUE OF
SERUM ENZYMES - MECHANISM OF ENZYME ACTION.



BMLT

202

ADVANCED HISTOPATHOLOGY AND CYTOPATHOLOGY TECHNIQUES

UNIT - 01

THEORY OF HISTOPATHOLOGY, RECEPTION OF SPECIMENS, HISTOPATHOLOGY OF TUMOR CELL

UNIT - 02

HISTOPATHOLOGY OF LIVER, KIDNEY, ADRENAL, OVARY, TESTIES

UNIT - 03

METHOD OF PREPARING STAINS & FIXATIVES.

UNIT - 04

THEORY OF TISSUE PROCESSING AND EMBEDDING

UNIT - 05

THEORY OF H & E STAINING

UNIT - 06

USE OF MICROTOME

UNIT - 07

TISSUE SECTION CUTTING

UNIT - 08

EMBEDDING AND PREPARATION OF BLOCKS

UNIT - 09

FIXATION OF TISSUE WITH DPX MOUNT

UNIT - 10

THEORY OF FROZEN SECTION PREPARATION

UNIT - 11

PREPARATION OF SMEAR FOR FINE NEEDLE ASPIRATION CYTOLOGY

UNIT - 12

PAP'S SMEAR THEORY AND IDENTIFICATION OF CELLS IN A NORMAL VAGINAL SMEAR



| | | |
|------|-----|------------------------------------|
| BMLT | 203 | ADVANCED MICROBIOLOGY AND SEROLOGY |
|------|-----|------------------------------------|

UNIT - 01

MICROBIOLOGY - INTRODUCTION TO MICROBIOLOGY - DEFINITION –
HISTORICAL SURVEY - INTRODUCTION TO LAB PROCESS.

UNIT - 02

MEDICAL MICROBIOLOGY - INTRODUCTION - ROLE OF MEDICAL
MICROBIOLOGY - LABORATORY RECORDS - BASIC PROCEDURES OF
DIAGNOSTIC MICROBIOLOGY.

UNIT - 03

STERILIZATION AND DISINFECTION - INTRODUCTION - MEANING - ROLE OF
QUALITY CONTROL - PROCEDURE OF QUALITY CONTROL.

UNIT - 04

QUALITY CONTROL - INTRODUCTION - MEANING - ROLE OF QUALITY CONTROL
- PROCEDURE OF QUALITY CONTROL.

UNIT - 05

BACTERIOLOGY - INTRODUCTION - DEFINITION - SYSTEMIC GROUPS OF
PATHOGENIC BACTERIA - IDENTIFYING CHARACTERISTICS OF COMMON
PATHOGENIC BACTERIA.

UNIT - 06

INFECTION - INTRODUCTION - DEFINITION - LAB IDENTIFICATION OF
INFECTIONS AGENTS - DIAGNOSIS OF ANAEROBIC INFECTIONS -
ANTIMICROBIAL SUSCEPTIBILITY TEST.



UNIT - 07

MYCOLOGY - INTRODUCTION - DEFINITION - LABORATORY DIAGNOSIS OF MITOTIC AGENTS - CLASSIFICATION - AGENTS - MYCOSIS - MUCOR - PENICILLIUM – ASPERGILLUS - DERMATOPHYTOSES - CANDIDA ALBICANS.

UNIT - 08

PARASITOLOGY - INTRODUCTION - MEANING - HELMINTHOLOGICAL - NEMATODE - CESTUSES AND TREMATODE - PROTOZOOLOGY - AMOEBAS - FLAGELLATES - CILIATE.

UNIT - 09

VIROLOGY - INTRODUCTION - DEFINITION - CLASSIFICATION OF DNA & RNA VIRUS – LAB INVESTIGATIONS AND DIAGNOSIS - DNA VIRUS - HERPES VIRUS - POX VIRUS – RNA VIRUS - PICORNO VIRUS - ARTHOMYXOVIRUS.

UNIT - 10

CULTURE TECHNIQUES - INTRODUCTION - METHODS OF CULTURE TECHNIQUES - TISSUE CULTURE - CHICK EMBRYO CULTURE - CELL CULTURE AND ANIMAL INOCULATES.

UNIT - 11

SEROLOGY - INTRODUCTION - DEFINITION - PRINCIPLES OF IMMUNOLOGICAL AGENTS - LAB PROCEDURES IN SEROLOGY - COLLECTION AND PREPARATION AND SPECIMENS.

UNIT - 12

SEROLOGICAL TEST - VDRL - WIDAL - CRP - RA - WFR - BRUCELLOSIS - ANTISTREPTOLYSIN O (ASO) - HUMAN IMMUNO DEFICIENCY VIRUS (HIV) - HEPATITIS B SURFACE ANTIGEN (HBSAG) - TPHA - PREGNANCY - RUBELLA – TOXOPLASMOSIS



| | | |
|------|-----|------------------------------------|
| BMLT | 204 | COAGULATION & TRANSFUSION MEDICINE |
|------|-----|------------------------------------|

UNIT - 01

PERIPHERAL BLOOD EXAMINATION - FOR RED BLOOD CELLS, LEUCOCYTES, PLATELETS AND ANY PARASITE

UNIT - 02

COLLECTION OF BLOOD, ANTICOAGULANTS

UNIT - 03

ESTIMATION OF HB CONCENTRATION

UNIT - 04

TOTAL RED BLOOD CELL COUNT

UNIT - 05

TOTAL LEUCOCYTE COUNT, PLATELET COUNT

UNIT - 06

ERYTHROCYTE SEDIMENTATION RATE(ESR)

UNIT - 07

COMPLETE HAEMOGRAM

UNIT - 08

BLEEDING AND CLOTTING TIME

UNIT - 09

PROTHROMBIN TIME AND PROTHOROMBIN TIME INDEX (P.T.I)

UNIT - 10

APTT, TT, CLOT RETRACTION TIME, COAGULATION DISORDERS

UNIT - 11

ABO GROUPING. & RH TYPING (SLIDE&TUBE GROUPING.)

UNIT - 12

DONOR SCREENING & SELECTION. BLEEDING PROCEDURE & STORAGE



| | | |
|------|-----|-----------|
| BMLT | 205 | PRACTICAL |
|------|-----|-----------|

UNIT - 01

- 1.STUDY OF INSTRUMENTS - I
- 2.OVERVIEW OF SKELETAL SYSTEMS - BONE, JOINTS, MUSCULAR SYSTEM
- 3.STUDY OF HUMAN BODY - LYMPHATIC SYSTEM, RESPIRATORY SYSTEM,
DIGESTIVE SYSTEM AND URINARY SYSTEM
- 4.ROUTINE BIO CHEMICAL ANALYSIS
- 5.SPUTUM ANALYSIS
- 6.LABORATORY DIAGNOSIS OF MITOTIC AGENTS

RECORD WORK AND EVALUATION:

- 1.LABORATORY POSTING
- 2.BLOOD BANK POSTING
- 3.ASSIGNMENT PRESENTATION

SCHEME OF PRACTICAL EXAM:

S.NO NAME OF EXAM MARK DURATION

1. SPOTTER EXAM (10 SPOTTER X 2 MARK/ EACH SPOTTER 20 30 MINT
2. HAEMATOLOGY PRACTICAL
PROCEDURE WRITING -10
PRACTICAL SKILL - 10
VIVA VOICE - 10 30 90 MINT
- 3.HUMAN EXPERIMENTAL PRACTICAL (OR) BIOCHEMICAL PRACTICAL
PROCEDURE WRITING -10
PRACTICAL SKILL AND VIVA VOICE - 10 20 60 MINT
4. RECORD NOTE
- 5 FOR RECORD WORK:



EVERY STUDENT SHOULD BE DONE THE FOLLOWING HAEMATOLOGICAL AND CLINICAL PHYSIOLOGY PRACTICAL AT LEAST ONE TIME DURING THAT PERIOD OF COURSE. AFTER THAT THEY SHOULD WRITE IN THE RECORD NOTE.

I. HAEMATOLOGICAL PRACTICAL LIST - (TOTALLY 15 NO'S [TOTALLY 15 NO'S PRACTICALS NAME GIVEN BSC (MLT)- 3YR PRACTICAL EXAMS

1. STUDY OF MICROSCOPE
2. STUDY OF COLLECTION OF BLOOD SAMPLE.
3. STUDY OF PREPARATION OF BLOOD SMEAR
4. STUDY OF DILUTING PIPETTES
5. DETERMINATION OF BLEEDING TIME
6. DETERMINATION OF CLOTTING TIME
7. ENUMERATION OF TOTAL RBC COUNT.
8. ESTIMATION OF HAEMOGLOBIN CONCENTRATION.
9. ENUMERATION OF WBC COUNT
10. DIFFERENTIAL LEUCOCYTE COUNT
11. DETERMINATION OF BLOOD GROUP
12. CALCULATE THE BLOOD INDICES
13. DETERMINATION OF PCV.
14. DETERMINATION OF ESR
15. ENUMERATE THE TOTAL PLATELETS COUNTS.

II. CLINICAL PHYSIOLOGY PRACTICALS:

1. STUDY OF CASE TAKING
2. RECORDING OF BODY TEMPERATURE
3. RECORDING OF RADIAL PULSE
4. MEASUREMENT OF BLOOD PRESSURE.
5. CLINICAL EXAMINATION OF RESPIRATORY SYSTEM
6. CLINICAL EXAMINATION OF CVS
7. CLINICAL EXAMINATION OF CNS
8. CLINICAL EXAMINATION OF REFLEXES



SINGHANIA UNIVERSITY

(Established by the Govt. of Rajasthan & recognized as per section 2f of UGC Act, 1956)
Pacheri Bari, Distt. Jhunjhunu (Rajasthan) - 333515

9. CLINICAL EXAMINATION OF LOCOMOTOR SYSTEM

10. CLINICAL EXAMINATION OF ABDOMEN



| | | |
|------|-----|-----------------------|
| BMLT | 206 | VIROLOGY AND MYCOLOGY |
|------|-----|-----------------------|

UNIT - 01

VIROLOGY - GENERAL MORPHOLOGY AND ULTRA STRUCTURE OF VIRUSES - CAPSIDS -HELICAL SYMMETRY - ICOSAHEDRAL SYMMETRY AND COMPLEX SYMMETRY.

UNIT - 02

ENVELOPE - GLYCOPROTEIN AND MATRIX PROTEIN - VIRAL GENOME - THEIR TYPES AND STRUCTURE.

UNIT - 03

CULTIVATION OF VIRUSES IN EMBRYONATED EGGS - EXPERIMENTAL ANIMALS AND CELL CULTURE - PRIMARY AND SECONDARY CELL CULTURE - SUSPENSION CELL CULTURE AND MONOLAYER CELL CULTURES.

UNIT - 04

ASSAYS OF VIRUSES - PHYSICAL AND CHEMICAL METHODS OF ASSAYS - PROTEIN NUCLEI ACID - RADIOACTIVITY TRACES - ELECTRONS MICROSCOPY - PLAQUE METHOD - POCK COUNTING METHOD - END POINT METHOD AND INFECTIVITY OF PLANT VIRUSES.

UNIT - 05

SEROLOGICAL METHODS - HAEMAGGLUTINATION - HAEMAGGLUTINATION INHABITATION - COMPLEMENT FIXATION - IMMUNOFLUROSCENCE ASSAYS (IFA) ELISA - RIA.



UNIT - 06

PLANT VIRUSES: RECENT ADVANCES IN CLASSIFICATION OF PLANT VIRUSES – LIFE SCIENCES AND OTHER DETAILS OF TMV AND MOSAIC VIRUS - POTATO VIRUS X

UNIT - 07

GENERAL IDEA ABOUT CYANOPHAGES - ACTINOPHAGES AND MYCOVIRUSES.

UNIT - 08

BACTERIOPHAGES - CLASSIFICATION - MORPHOLOGY AND ULTRASTRUCTURE
- ONE

STEP GROWTH CURVE (LATENT PERIOD, ECLIPSE PERIOD AND BURST SIZE) -
LIFE

CYCLE - LYTIC AND LYSOGENIC CYCLES OF BACTERIOPHAGES.

UNIT - 09

ANIMAL VIRUSES - CLASSIFICATION AND NOMENCLATURE - CYCLES AND
OTHER DETAILS OF DNA VIRUSES - HERPES - ADENO AND SV40

UNIT - 10

LIFE CYCLE AND OTHER DETAILS OF RNA VIRUSES - RETROVIRUSES -
ONCOGENIC

VIRUSES AND LENTIVIRUSES (HIV) - PICORNA - ORTHO MYXO AND PARAMYXO.

UNIT - 11

MYCOLOGY - CLASSIFICATION OF FUNGI - GROWTH AND ISOLATION -
MYCOSES (ALLTYPES) - LABORATORY DIAGNOSIS OF MYCOTIC DISEASES.

UNIT - 12

IMMUNITY IN FUNGAL DISEASES AND VALUE OF IMMUNO DIAGNOSIS - ROLE
OF MYCOTOXIN - ANTIFUNGAL AGENTS - EPIDEMIOLOGY OF FUNGAL
DISEASES.



BMLT

301

IMMUNO HAEMATOLOGY AND TRANSFUSION MEDICINE

UNIT - 01

HISTORY OF IMMUNOLOGY, STRUCTURES, COMPOSITIONS AND FUNCTIONS OF CELLS AND ORGANS INVOLVED IN IMMUNE SYSTEM.

UNIT - 02

HOST PARASITIC RELATIONSHIPS. MICROBIAL INFECTIONS-IMMUNE RESPONSE -IMMUNITY AND ITS TYPES.

UNIT - 03

ANTIGEN-STRUCTURES, PROPERTIES AND TYPES OF ANTIGEN. STRUCTURES, TYPES AND PROPERTIES OF IMMUNOGLOBULINS.

UNIT - 04

COMPONENT, PROPERTIES AND FUNCTIONS OF COMPLEMENT SYSTEM. COMPLEMENT PATHWAY AND ITS ACTIVATION.

UNIT - 05

ANTIBODY ACTIONS - AGGLUTINATIONS - PRECIPITATION - COMPLEMENT FIXATION IMMUNO FLUORESCENCE - ELISA, RADIOIMMUNE ASSAYS.

UNIT - 06

SKIN TEST AND IMMUNE COMPLEX. TISSUE DEMONSTRATION. APPLICATIONS OF THESE METHODS IN DIAGNOSIS OF MICROBIAL DISEASE. DOT BLOTING, WESTERN BLOTING, ELISA AND RADIAL IMMUNO DIFFUSION.

UNIT - 07

BLOOD GROUPS - BLOOD TRANSFUSION AND RH INCOMPATIBILITIES, HYPERSENSITIVITY REACTIONS.



UNIT - 08

ANTIBODY MEDIATED TYPE I ANAPHYLAXIS - TYPE 2 ANTIBODY DEPENDENT CELL CYTOTOXICITY - TYPE 3 IMMUNE COMPLEXMEDIATED REACTION - TYPE 4 CELL MEDIATED HYPERSENSITIVITY REACTION.

UNIT - 09

PHEIPHERAL BLOOD EXAMINATIONS FOR RBC, WBC, PLATELETS AND ANY PARASITE COLLECTION OF BLOOD - ANTICOAGULANTS.

UNIT - 10

ESTIMATION OF HB CONCENTRATION TOTAL RBC COUNT, TOTAL WBC COUNT - DLC - PLATELET COUNT - ERYTHROCYTE SEDIMENTATION RATE.

UNIT - 11

BLEEDING TIME AND CLOTTING TIME - DETERMINATION OF PROTHROMBIN TIME AND CLOT RETRACTION TIME - COAGULATION DISORDERS.

UNIT - 12

ABO GROUPING AND RH GROUPING - DETERMINING DONOR SCREENING AND SELECTION - PROCEDURE AND STORAGE OF BLOOD TRANSFUSION



BMLT

302

ADVANCED VIROLOGY AND MYCOLOGY

UNIT - 01

GENERAL PROPERTIES OF VIRUS, VIRUS - HOST INTERACTIONS.

UNIT - 02

LABORATORY DIAGNOSIS OF VIRAL INFECTION, VIRAL VACCINES,
BACTERIOPHAGE

UNIT - 03

POX VIRIDAE, HERPES VIRIDAE

UNIT - 04

ADENOVIRIDAE, PARVOVIRIDAE AND PAPOVIRIDAE, PICORNAVIRIDAE

UNIT - 05

RHABDOVIRIDAE, ORTHOMYXOVIRIDAE

UNIT - 06

PARAMYXOVIRIDAE, CALCIVIRIDAE, ASTROVIRIDAE AND CORONAVIRIDAE

UNIT - 07

ARBOVIRUSES, TOGAVIRIDAE, FLAVIVIRIDAE, BUNYAVIRIDAE

UNIT - 08

FILOVIRIDAE, ARENAVIRIDAE AND REOVIRIDAE, RETROVIRIDAE

UNIT - 09

HEPATITIS VIRUSES, ONCOGENIC VIRUSES

UNIT - 10

SLOW VIRUS INFECTION AND PRIONS

UNIT - 11

CLASSIFICATION OF FUNGI, LABORATORY DIAGNOSIS OF MYCOSIS

UNIT - 12

CLASSIFICATION OF MYCOSIS, MEDICAL MYCOLOGY



| | | |
|------|-----|------------------------------|
| BMLT | 303 | ADVANCED LAB INSTRUMENTATION |
|------|-----|------------------------------|

UNIT - 01

1. SAFETY MEASURES
2. PH AND BUFFER SOLUTION
3. PHOTOMETRIC TECHNIQUES
4. CENTRIFUGATION TECHNIQUES

UNIT - 02

1. CHROMATOGRAPHY
2. ELECTROPHORESIS
3. MOLECULAR BIOLOGY TECHNIQUES
4. AUTOMATION IN CLINICAL CHEMISTRY

UNIT - 03

AUTOMATED CELL COUNTER 18 PARAMETERS AND 21 PARAMETERS,
COAGULOMETER, MICROHEMATOCRIT

UNIT - 04

FLOW CYTOMETRY, QBC ANALYSIS, ELISA READER

UNIT - 05

COMPONENT SEPARATOR, CELL WASHER, BLOOD BAG SHAKER

UNIT - 06

REPRIGERATED CENTRIFUGE, APHERESIS MACHINE, AUTOMATION IN BLOOD
GROUP SEROLOGY - PHOTOMETRIC READING SYSTEM AND CONTINUOUS
FLOW SYSTEM.

UNIT - 07

AUTOMATIC TISSUE PROCESSOR., AUTOMATED MICROTOME, AUTOMATED
KNIFE SHARPENING MACHINE AUTOMATED HONES



UNIT - 08

AUTOMATED STAINER, CRYOSTAT, TRINOCULAR MICROSCOPE WITH MICROPHOTO ACCESSORIES AND MONITOR, COMPUTER PRINTER AND SCANNER

UNIT - 09

ELECTRON MECROSCOPE, CYTOCENTRIFUGE, TISSUE MICROARRAY, AUTO PAP STAINER

UNIT - 10

HOT AIR OVEN, AUTOCLAVE, INCUBATOR, BIOSAFETY CABINET

UNIT - 11

MICROSCOPE: LIGHT MICROSCOPE, FLUORESCENT MICROSCOPE, DARK FIELD MICROSCOPE, ELECTRON MICROSCOPE

UNIT - 12

CENTRIFUGE, ELISA READER, PCR, BACTEC, API SYSTEM



| | | |
|------|-----|----------------------------|
| BMLT | 304 | PRACTICAL MLTL BSC LAB III |
|------|-----|----------------------------|

UNIT - 01

- 1.SPECIAL HAEMATOLOGICAL TEST
- 2.COMPATIBILITY TESTING IN BLOOD BANKING
- 3.COOMBS TESTING IN BLOOD BANKING
- 4.STUDY OF INSTRUMENTS - II
- 5.METHOD OF COLLECTION OF SAMPLES
- 6.ANALYSIS OF BLOOD

RECORD WORK AND EVALUATION:

- 1.CLINICAL LAB DEMONSTRATION
- 2.LABORATORY POSTING
- 3.BLOOD BANK POSTING

SCHEME OF PRACTICAL EXAM:

S.NO NAME OF EXAM MARK DURATION

1.SPOTTER EXAM (10 SPOTTER X 2 MARK/ EACH SPOTTER 20 30 MINT

2.HAEMATOLOGY PRACTICAL

PROCEDURE WRITING -10

PRACTICAL SKILL - 10

VIVA VOICE - 10 30 90 MINT

3.BIOCHEMICAL ANALYSIS IN BLOOD (OR) PATHOLOGICAL TEST IN BLOOD

PROCEDURE WRITING -10

PRACTICAL SKILL AND VIVA VOICE - 10 20 60 MINT

4. RECORD NOTE 5

TOTAL 75 3 HOUR

FOR RECORD WORK:

EVERY STUDENT SHOULD BE DONE THE FOLLOWING HAEMATOLOGICAL PRACTICALS



AT LEAST ONE TIME IN OWN BLOOD. THEN WRITE THE AIM, APPARATUS REQUIRED, PROCEDURE , CALCULATION, RESULT AND DISCUSSION OF CONCERN PRACTICAL IN THIS MODEL.

I. HAEMATOLOGICLA PRACTICAL LIST - (TOTALLY 15 NO`S [TOTALLY 15 NO`S PRACTICALS NAME GIVEN BSC (MLT)- 3YR PRACTICAL EXAMS

- 1.STUDY OF MICROSCOPE
- 2.STUDY OF COLLECTION OF BLOOD SAMPLE.
- 3.STUDY OF PREPARATION OF BLOOD SMEAR
- 4.STUDY OF DILUTING PIPETTES
- 5.DETERMINATION OF BLEEDING TIME
- 6.DETERMINATION OF CLOTTING TIME
- 7.ENUMERATION OF TOTAL RBC COUNT.
- 8.ESTIMATION OF HAEMOGLOBIN CONCENTRATION.
- 9.ENUMERATION OF WBC COUNT
- 10.DIFFERENTIAL LEUCOCYTE COUNT
- 11.DETERMINATION OF BLOOD GROUP
- 12.CALCULATE THE BLOOD INDICES
- 13.DETERMINATION OF PCV.
- 14.DETERMINATION OF ESR
- 15.ENUMERATE THE TOTAL PLATELETS COUNTS



BMLT

305

PRACTICAL MLTL BSC LAB IV

UNIT - 01

- 1.ANALYSIS OF URINE
- 2.ANALYSIS OF BODY FLUIDS
- 3.GASTRIC FUNCTION TEST
- 4.RENAL FUNCTION TEST
- 5.LIVER FUNCTION TEST
- 6.PANCREATIC FUNCTION TEST

RECORD WORK AND EVALUATION:

- 1.LABORATORY POSTING
- 2.BLOOD BANK POSTING
- 3.ASSIGNMENT PRESENTATION

SCHEME OF PRACTICAL EXAM:

S.NO NAME OF EXAM MARK DURATION

1 SPOTTER EXAM (10 SPOTTER X 2 MARK/ EACH SPOTTER 20 30 MINT

2 HAEMATOLOGY PRACTICAL

PROCEDURE WRITING -10

PRACTICAL SKILL - 10

VIVA VOICE - 10 30 90 MINT

3 BIOCHEMICAL ANALYSIS

PROCEDURE WRITING -10

PRACTICAL SKILL AND VIVA VOICE - 10 20 60 MINT

4 RECORD NOTE 5

TOTAL 75 3 HOUR

FOR RECORD WORK.

EACH AN EVERY STUDENT SHOULD BE DONE THE FOLLOWING

HAEMATOLOGICAL AND



BIOCHEMICAL ANALYSIS PRACTICAL ATLEAST ONE TIME DURING THE PERIOD OF COURSE. AFTER THAT WRITE IN RECORD WORK IN THE HEADING OF AIM, REQUIREMENTS, PROCEDURE, RESULT AND DISCUSSION IN EVERY PRACTICAL.

I. HAEMATOLOGICLA PRACTICAL LIST

- 1.STUDY OF MICROSCOPE
- 2.STUDY OF COLLECTION OF BLOOD SAMPLE.
- 3.STUDY OF PREPARATION OF BLOOD SMEAR
- 4.STUDY OF DILUTING PIPETTES
- 5.STUDY OF HAEMOCYTOMETER
- 6.DETERMINATION OF BLEEDING AND CLOTTING TIME
- 7.ENUMERATION OF TOTAL RBC, WBC AND PLATELETS COUNT.
- 8.DETERMINATION OF BLOOD GROUP
- 9.DIFFERENTIAL LEUCOCYTE COUNTS
- 10.DETERMINATION OF ESR

II. BIOCHEMICAL ANALYSIS:

- I.DETERMINATION OF BLOOD SUGAR, CREATININE, CHOLESTEROL, UREA, URIC ACID, BILIRUBIN.