

**1) Introduction of Bones of the Human Body of :**

- Upper Limb : clavicle, scapula, humerus, radius, ulna, carpal, metacarpal & phalanges
- Lower Limb : hipbone, femur, tibia, fibula, tarsus, metatarsus & phalanges
- Skull : name the bone of skull and sutures between them
- Thorax : ribs and their articulations
- Vertebral Column : cervical, thoracic, lumbar, sacral and coccygeal vertebrae

**2) Surface Markings of the Whole Body :**

- Nine regions of the abdomen
- Hip
- Skull

**3) Introduction of different Vital Organs :-**

**A) Respiratory Organs :**

- Nasopharynx
- Oropharynx
- Larynx
- Trachea
- Bronchi
- Lungs (and their lobular segments)
- Thoracic cavity
- Pleura and Pleural cavity

**B) Circulatory Organs :**

- Anatomical position of the heart
- Pericardium of the heart
- Chambers of the heart
- Great vessels of the heart
- Valves of the heart

**C) Digestive Organs :**

- Tongue
- Teeth
- Oral cavity
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine

**D) Reproductive Organs:**

- Introduction of male Genital Organs (Gonads) : Testes, Epididymis
- Introduction of female Genital Organs:- Ovary, Fallopian Tube, Uterus, Vagina

**E) Liver, Gall Bladder and Spleen :**

- Introduction
- Anatomical position

**F) Excretory Organs:**

- Cortex and Medulla of Kidney
- Ureter
- Urinary Bladder
- Urethra (male and female)

**G) Muscles :**

- Introduction, Origin and Insertion, Function

**H) Embryology: Only Introduction**

**I) Endocrine Glands: Morphology and Anatomical relation**

- Pituitary Gland
- Thyroid Gland
- Para Thyroid Gland
- Supra-renal glands

**J) Nervous System:**

- Neuron Theory
- Classification of Nervous System
- Name of Basal membrane
- Blood supply of brain
- Cranial Nerves
- Sympathetic & Parasympathetic system

**K) Sense Organs:**

- Skin - Histology, Epidermis and Dermis
- Eye - Morphology, Parts of eye, Histology, Visual pathway and Optic nerve
  - Lachrymal apparatus, Extra ocular muscles & it's Nerve supply
- Ear
- Nose
- Tongue

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY1st Year

Sub:- ANATOMY

Practical (Only INTERNAL)

1. Labelled Diagram of different organs and bones
2. Surface Markings of the Body
3. Demonstration of Histological Slides-
  - a. Cartilage b. Bone c. Smooth Muscles d. Skeletal Muscles
4. Radiography of Normal Bones, Joints and Chest.

NO UNIVERSITY EXAMINATION

*[Handwritten signatures and initials]*

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY 1<sup>ST</sup> YEAR**

**Subject :- PHYSIOLOGY THEORY (Paper-2) F.M.-70 (Hrs.-3hrs)**

1. **Cell: Biology :-** Cell membrane structure, intracellular organelles and their functions and cytoskeleton
  - Definition
  - Structure and functions the cytoplasmic Organelles
  - Reproduction : Meiosis, Mitosis
2. **The important physio-chemical laws applied to physiology**
  - Diffusion
  - Osmosis
  - Dialysis
3. **Fundamentals of different Organ System**
  - Cardiovascular System
  - Respiratory System
  - Digestive System
  - Excretory system
  - Reproductive System
  - Endocrine System
  - Lymphatic System
4. **Blood**
  - Definition
  - Composition
  - Function
5. **Formation of different type of blood Cells**
  - Erythrocytes
  - Leucocytes
  - Thrombocytes
6. **Mechanism of Blood Clotting**
7. **Cerebrospinal Fluid**
  - Formation & Circulation
  - Composition
  - Circulation and Function
8. **Special Senses**
  - Hearing
  - Taste
  - Smell
  - Sight
9. **Kidney, General introduction, structure and function**
10. **Endocrine : Secretion, regulation and functions of pituitary, thyroid, adrenal, pancreas, parathyroid, testis & ovaries**
11. **Respiratory System : introduction , general Organization, Mechanics of respirations, pulmonary volumes and capacities, Transport of respiratory gases, Nervous and chemical, control of respiration, pulmonary function tests.**
12. **Cardiovascular System : Structure and properties of cardiac muscle, Cardiac cycle Regulation of heart rate, Cardiac output , Blood pressure, its regulation, Regional circulation, coronary , cerebral circulation , Cardio respiratory changes during exercise , Normal ECG.**
13. **Physiology of Exercise : Effects of acute and chronic exercise on Oxygen transport, B.M.R. /R.Q / Body fluids and electrolytes.**

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

1<sup>st</sup> Year

Subject :- **PHYSIOLOGY**

**PRACTICAL** (Only INTERNAL)

Labelled diagrams of different Vital Organs & System

Labelled diagrams of Corpuscles

Blood grouping Rh Typing

Determination of Vital Capacity.

Auscultations of Heart Sound

Blood pressure Recording

Pulse Rate, Heart Rate

BMI

NO UNIVERSITY PRACTICAL EXAMINATION

Dr. [Signature] [Signature] [Signature] [Signature] [Signature] [Signature]

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY**

**1<sup>st</sup> Year**

**Sub :- Pathology**

**THEORY (Paper-3)**

**F.M.-70**

**(Hrs.-3hrs)**

**A) General Pathology**

The Cell in health and disease

- a. Introduction of pathology
- b. Cellular structure and metabolism
- c. Inflammation - Acute and Chronic
- d. Derangement of Body Fluids and Electrolytes
  - Types of shocks
  - Ischaemia
  - Infection
- e. Neoplasia - Etiology and Pathogenesis

**B). Hematology (Normal and Abnormal)**

- a. Formation of Blood
- b. Erythropoiesis
- c. Leucopoiesis
- d. Thrombopoiesis
- e. Collection of Blood
- f. Anticoagulants- mechanism of coagulation
- g. Red cell count - Haemocytometer, Methods and Calculation
- h. WBC Count - Methods, RBC - Indices, Platelets
- i. Differential Leucocytes Count (DLC) -  
Morphology of White Cells, Normal Values  
Romanowsky Stains : Staining procedures  
Counting Methods, Principle of staining
- j. Hb estimation - Method  
Colorimetric Method  
Clinical importance
- k. Normal Haemostasis - BT, CT Prothrombin Time
- l. Blood Bank - Introduction Blood Grouping and Rh Typing, Cross matching.
- m. ESR

**C). Clinical Pathology**

**Body Fluids :**

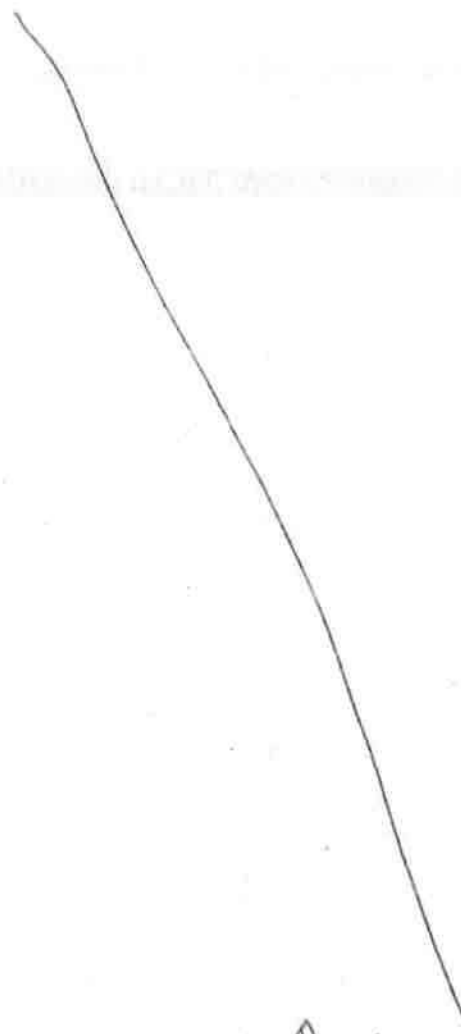
- a. Urine :
  - Method of Collection
  - Normal Constituents
  - Physical Examination
- b. Stool Examination :
  - Method of Collection
  - Normal Constituents and appearance
  - Abnormal Constituents (Ova, Cyst)
- c. CSF Examination :
  - Physical Examination
  - Chemical Examination
  - Microscopy
  - Cell Count
  - Staining

d. Semen analysis

- Collection
- Examination
- Special Tests

D). Histopathology

- Introduction
- Techniques of - Receiving, grossing, mounting, section cutting.
- Various fixative modes of action preparation and indication.
- Decalcification of tissues.
- Tissues processing for routine paraffin section.
- Staining of Tissues - H & E staining.
- Maintenance of records and filling of the slides.
- Bio medical waste management.
- Preparation of Museum specimens.



*Am*

*AS*

*h*

*Dr*

*Vus*

*Dr*

*AS*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

1<sup>st</sup> Year

Sub :- Pathology

Practical (ONLY INTERNAL)

- Collection of Sample
- Hb estimation
- TLC and DLC
- RBC, WBC, Platelet Count
- Peripheral blood film - staining and study of Malarial Parasite Thick & Thin
  - a). Urine, Stool, Semen and CSF - Collection, Handling, Examinations
  - b). Absolute Eosinophil Count, PCV, RBC indices, ESR Estimation, Platelet Count
- Blood grouping Rh Factor Tube Method Slide Method
- 1. Bleeding Time, Clotting Time, PT, APTT, TT, Platelet Count & Platelet Function Test
- Histopathology Section cutting and H & E Staining

NO UNIVERSITY PRACTICAL EXAMINATION

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY**

**1<sup>st</sup> Year**

**Sub :- Microbiology      THEORY    (Paper---(4-a))    F.M.-35    (Hrs.-1.5hrs)**

**COURSE CONTENTS :**

1. Introduction and brief history of Microbiology
  - Historical Aspect
  - Micro- Organism in Health and Disease
2. Requirement and uses of common Laboratory Equipments
  - Incubator, Hot Air Oven, Water Bath
  - Anaerobic Jar, Centrifuge, Autoclave
  - Microscope
  - Glassware - Description of Glassware, its use, handling and care
3. Sterilization :
  - Methods of Sterilization and it's Principle
  - Culture Media
  - Autoclave - its structure, functioning, control and indicator
4. Antiseptics & Disinfectants
  - Definition
  - Types
  - Mode of Action
  - Uses
5. Collection, Transportation and processing of clinical samples for Microbiology investigations

**COURSE CONTENTS**

**General Bacteriology**

- Definition
- Morphology, Physiology and Classification of Bacteria
- Structure of Bacterial cell, Capsule, Flagella and Spores
- Growth of Bacteria
- Nutrition of Bacteria
- Staining Techniques used for Bacteriology

**Virology :**

- Definition
- General Properties of Viruses
- Pathogenesis of Viral Infection
- Diseases caused by different Virus and mode of infection

**Parasitology :**

- Definition
- General description of Parasites and Host
- Classification of Parasite
- Mode of transmission of parasitic diseases

**Fungus :**

- Definition
- Structure
- Classification

*[Handwritten signatures and initials at the bottom of the page]*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

1<sup>st</sup> Year

**Sub :- Microbiology**

**Practical (ONLY INTERNAL)**

Demonstration of washing of instruments

Staining - Type of Staining, Principle, Procedure and Interpretation

Culture - Urine, Blood, Body, Fluid, Water Stool, Swab

Types of media

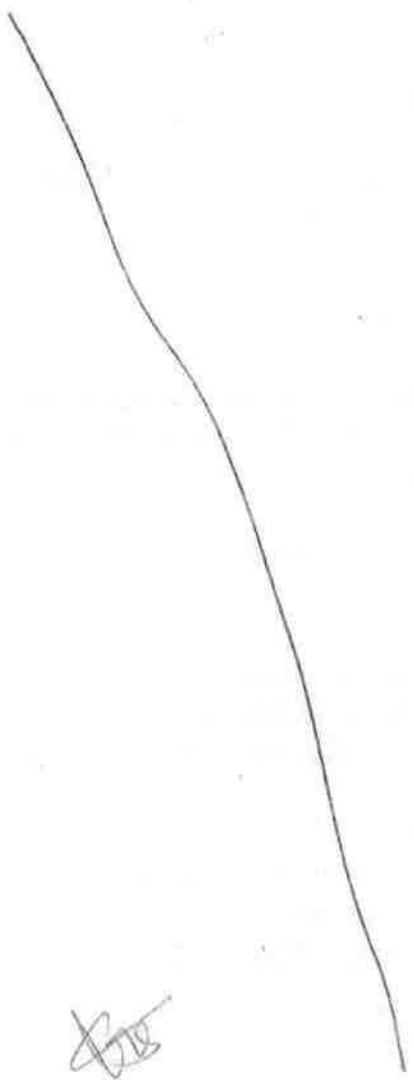
Colony Characteristics

VDRL, ASO, CRP, WIDAL

Stool Exam

Microscopic Stool Exam

NO UNIVERSITY PRACTICAL EXAMINATION



De May Val Gnt ce h

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY****1<sup>st</sup> Year****Subject :- BIOCHEMISTRY THEORY (Paper---(4-b)) F.M.-35 (Hrs.-1.5hrs)****(1) PHYSICAL BIOCHEMISTRY**

1. Introduction of Biochemistry
2. Elementary knowledge of inorganic chemistry :- Atomic weight, molecular weight, equivalent weight, acid, bases.
3. Definition and preparation of solutions :- percent solution, Molar solution, Normal solution and Buffer Solution etc.
4. Definition and preparation of Reagent.
5. Unit of measurement
6. PH indicators: pH paper, universal and other indicators, pH measurement : different methods.
7. Ionization of water buffer PH value of solution using.

**(2) GENERAL BIOCHEMISTRY**

1. Aim and scope of Biochemistry
2. Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation and disposal of Biological material.
3. Chemical examination of urine :Qualitative, Sugar, Protein, Bile Salt, Bile Pigment, Ketones Bodies
4. Chemical examination of Stool :Occult Blood.
5. Chemical examination of other Body fluids : CSF, Pleural Fluid, Ascitic Fluid etc.
6. Laboratory management and Maintenance of Records.

**INTRODUCTORY KNOWLEDGE OF :-****Carbohydrates:-**

- Importance
- Classification
- Properties
- Estimation of Glucose
- Clinical Significance

**Protein :-**

- Introduction and Physiological importance
- Amino acids
- Essential amino acids
- Classification
- Denaturation of Proteins
- Estimation of Total protein, albumin, Globulin, A/G Ratio

**Lipids :-**

- Definition and Introduction of Lipids
- Functions of Lipids
- Classification
- Properties of Lipids
- Clinical significance
- Steroids
- Estimation :Total lipids, HDL, LDL, VLDL, Total cholesterol, Triglyceride



**Electrolytes :**

- Function
- Properties
- Estimation of Essential electrolytes: Sodium , Potassium, calcium, chloride and phosphate etc.
- Clinical Importance

**Liver Function Test (LFT) :-**

- Introduction
- Functions of liver
- Bile pigment
- Type of Jaundice
- Clinical significance

**Kidney function tests (KFT):-**

- Structure and function of Kidney
- Formation of urine
- Urea and Uric acid estimation

**(3) ANALYTICAL BIO-CHEMISTRY**

Estimation of specific gravity of urine,

Urinary proteins

Blood sugar

Blood urea

Serum Creatinine

Blood Cholesterol

Serum Bilirubin, SGPT, SGOT,

Alkaline Phosphatase

Australia Antigen

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY**

**1<sup>st</sup> Year**

**Subject :- BIOCHEMISTRY**

**PRACTICAL (ONLY INTERNAL)**

**Practical**

Introduction and usage of Glassware and Instruments.

**Glassware :**

- Composition of Glass
- General glass wares

**Instruments :**

- Balance
- Hot plate and Magnetic stirrer
- Centrifuges
- Incubators
- Constant temperature bath
- Colorimeter : Principle Function
- Photometer
- Flame Photometry
- Urine Examination Physical, Microscopic, Biochemical
- Stool Examination
- Body Fluids : Physical and chemical examination CSF Pleural Fluid , Ascitic fluid.
- Methods of estimation of glucose : Benedicts Reaction, Glucose oxidase
- Methods of estimation of urea.
- Methods of estimation of creatinine.
- Methods of estimation of Cholesterol.
- Methods of estimation of Bilirubin.
- Methods of estimation of SGOT, SGPT

**NO UNIVERSITY PRACTICAL EXAMINATION**

*[Handwritten signatures and marks]*

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY      1st Year**  
**SUBSIDIARY SUBJECT ----- COMMUNICATIVE SKILLS (ENGLISH)**  
**THEORY      F.M.-35      (Hrs.-1.5hrs)**

**COURSE OUTLINE**

**COURSE DESCRIPTION :** This course is designed to help the student acquire a good command and comprehension of the English language through individual papers and conferences.

**BEHAVIOURAL OBJECTIVES :**

The student at the end of training is able to

1. Read and comprehend English language.
2. Speak and write grammatically correct English.
3. Appreciates the value of English literature in personal and professional life.

**UNIT - I: INTRODUCTION :**

Study Techniques

Organization of effective note taking and logical processes of analysis and synthesis use of the dictionary

Enlargement of vocabulary

Effective diction

**UNIT - II : APPLIED GRAMMER :**

Correct usage

The structure of sentences

The structure of paragraphs

Enlargement of Vocabulary

**UNIT - III : WRITTEN COMPOSITION :**

Practise writing and summarizing

Writing of bibliography

Enlargement of Vocabulary

**UNIT - IV : READING AND COMPREHENSION :**

Review of selected materials and express on self in one's words.

Enlargement of Vocabulary

**UNIT - V : THE STUDY OF THE VARIOUS FORMS OF COMPOSITION :**

Paragraph, Essay, Letter, Summary Practice, in writing

**UNIT - VI : VERBAL COMMUNICATION :**

Discussions and summarization, Debater, Oral reports Use in teaching

*B*

*Aug - Vics*

*es*

*Am*

*225*

*h*

*dk*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

1<sup>st</sup> Year

**SUBSIDIARY SUBJECT - COMPUTER SKILLS**

THEORY      F.M.-20      (Hrs.-1.5hrs)

&

PRACTICAL      F.M.-15

**Basic Computer Course (BCC)**

1. **Knowing computer:** What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.
2. **Operating Computer using GUI Based Operating System:** What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts, Basics of O.S Setup; Common utilities.
3. **Understanding Word Processing:** Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.
4. **Using Spread Sheet: Basics of Spreadsheet;** Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY**

**2nd Year**

**Sub :- Pathology      THEORY    (Paper---1)    F.M.-70    (Hrs.-3 hrs)**

**General Pathology**

- a) Human blood group antigens and antibodies
- b) ABO Blood group systems
  - Sub. - group
  - Source of antigens and types of antibodies
- c) Rh Blood group System
  - Types of Antigen
  - Mode of Inheritance
  - Types of Antibodies
- d) Other Blood group Antigens
- e) Blood Collection
  - Selection and screening of donor
  - Collection of blood
  - Various anticoagulants
  - Storage of blood
  - Changes in blood on storage

**Blood Banking**

- 1. Component Preparations
  - Packed Cells
  - Fresh Frozen Plasma
  - Platelets
- 2. Blood Storage
  - Anticoagulant Preparation
  - Recording the details and storage of blood
  - Maintenance and changing of various equipments
- 3. Transfusion Reaction and Mismatch Transfusion - Lab Diagnosis



BACHELOR OF MEDICAL LABORATORY TECHNOLOGY2<sup>nd</sup> Year

Sub :- Pathology

Practical (ONLY INTERNAL)2<sup>nd</sup> Year 1<sup>st</sup> Paper**Pathology**

- a) Blood grouping
- b) Urine, Stool, Semen and CSF - Collection, Handling, Examinations
- c) Absolute Eosinophil Count, PCV, RBC indices, ESR Estimation, Platelet Count
- d) Blood grouping, Rh Factor Tube Method Slide Method
- e) Bleeding Time, Clotting Time, PT, APTT, TT, Platelet Count & Platelet Function Test
- f) Antigen, Antibodies, Rh Factor, ASO Titre, VDRL

NO UNIVERSITY EXAMINATION

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY****2<sup>nd</sup> Year****Subject:-MICROBIOLOGY THEORY (Paper---(2-a)) F.M.-35 (Hrs.-1.5hrs)****COURSE CONTENTS****1. Staining of Bacteria:**

- Composition and preparation of Staining
- Principle and Procedure of Bacteriological stain
- Gram's Stain
- Ziehl -Neelsen Stain
- Albert Stain
- Spore and Negative Stain

**2(a) Cultivation of Micro-organism:**

- Introduction and uses of culture
- Classification of common of Laboratory culture media
- Special media and preparations
- Techniques of inoculation and isolation
- Antimicrobial sensitivity
- Anaerobic cultivation techniques

**2(b) Laboratory Diagnosis of Viral Diseases**

- Direct demonstration of virus.
- Detection of viral Antigen.
- Detection of viral Antibody
- Prevention of Viral disease
- Immunity in Viral infection

**3. Immunology**

- Definition
- Immunity :Definition and Classification
- Antigen
- Antibodies -Immunoglobulin
- Antigen and antibody reaction and clinical importance
- Structure and function of immune system
- Immune response
- Hypersensitivity

**4. Principle & procedure of Serological Tests.**

- WIDAL, CRP, Brucella , Agglutination ,ASO
- Cold agglutination, VDRL, TPHA
- Advanced techniques in Microbiology ELISA,RIA etc

**5. General introduction, life cycle, mode of transmission, pathogenicity, and lab diagnosis of Various Protozoa -**

- i) Entamoeba Histolytica
- ii) Entamoeba coli
- iii) Giardia lamblia
- iv) Trichomonas Vaginalis
- v) Leishmania donovani

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY2nd Year

Subject:-MICROBIOLOGY Paper 2-a PRACTICAL F.M.-25

- 1) Staining : ZN Staining of M.T.B and M. Lepra, Albert Staining
- 2) Culture
  - Type of media
  - Preparation
  - Inoculation
  - Colony Characteristic
  - Staining and Antibiotic Sensitivity
  - Demonstration :
    - Slide Agglutination
    - VDRL
    - WIDAL
    - ASO
    - CRP
  - Stool Examination
  - Physical
  - Microscopic Demonstration of Ova, Cyst, Pus Cells
  - Hanging Drop Examination

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

2<sup>nd</sup> Year

**Subject:-ADVANCE PATHOLOGY THEORY (Paper---(2-b)) F.M.-35 (Hrs.-1.5hrs)**  
**IMMUNOLOGY AND SEROLOGY**

Hormones - Thyroid Hormones, Growth Hormones, Insulin  
Glycosylated Haemoglobin - COOMB'S Tests, Direct and indirect test  
Titration of Antibody

**HISTOPATHOLOGY**

- a) Fixation of tissues, Classification of Fixatives
- b) Tissue processing, Collection, Steps of fixation
- c) Section Cutting - Microtome and Knives, Techniques of Section Cutting, Mounting of Sections, Frozen Sections and Cryostats
- d) Decalcification - Fixation, Decalcification, End point
- e) Staining dyes and their properties, H & E Stain, Special Stains

**Autopsy technique**

1. Assisting in Autopsy
2. Preservation of Organs and Tissue Processing

**AIDS Updates :**

1. Brief Path physiology
2. Diagnostic Technique -Screening
3. Safety in Laboratory
4. Sterilization of AIDS sample and it's disposal

**Automation in pathology**

1. Semi - Automatic and Fully Automatic Analyzer - working and methodology
2. Maintenance of Instruments
3. Handling and Quality Check

B<sub>2</sub>

vw

Q-1

Contd. Pg.no.....21

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY2nd Year**Subject:-ADVANCE PATHOLOGY      Paper 2-b****PRACTICAL : F.M.-25**

- COOMB'S test
- Anti D Titre
- LE Cell Preparation
- Electrophoresis Technique -Protein & Haemoglobin
- High performance liquid Chromatography
- Micro column technique
- Histopathology
- Techniques of - Receiving, grossing, mounting, Section cutting.
- Declaration of tissues.
- Staining of Tissues-H & E staining.
- Tissues processing for routine paraffin section.
- Various fixative mode of action preparation and indication.
- Maintenance of records and filling of the slides.
- Bio- Medical waste management.

Dr

Viel

cr

PW

h

Contd. Pg.no.....22

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

2nd Year

Subject:-**BIOCHEMISTRY**      **THEORY** (Paper---3)      **F.M.-70**      **(Hrs.-3 hrs)**

**COURSE CONTENTS**

**1) Carbohydrates :-**

- Introduction and Importance
- Metabolism of Carbohydrates
  - Glycolysis and its regulation
  - TCA cycle and its regulation
- Estimation of Glucose
- Clinical Significance

**2) Protein :-**

- Introduction, Properties and Structure of Proteins
- Amino acids
- Essential amino acids
- Metabolism of Amino acid
- Renaturation of Proteins / Amino acid
- Estimation of Total protein, Albumin, Globulin, A/G Ratio

**3) Introduction, Properties and functions of important hormones**

**4) Enzymes and Co-enzymes**

- Introduction and difference
- Functions
- Classification of enzymes on basis of nomenclature
- Properties of enzymes
- Co-enzymes; Apo enzyme; Hollow enzymes (co-factors); Iso-enzyme-Prosthetic group

**5) Lipids :-**

- Introduction and Functions
- Absorption and Digestion of Lipids
- Metabolism - Oxidation of Fatty acid
- Ketone bodies and Biosynthesis of fatty acid

**6) Principle of Assay procedures for biological material and estimation of kidney function tests.**

- Urea, Uric acid, Creatinine

**7) Electrolytes :**

- Function, Properties
- Estimation of Essential electrolytes:- Sodium, potassium, calcium, chloride and phosphorus etc.
- Clinical Importance

**8) Genetics**

- DNA, RNA Structure
- Gene coding
- Transcription
- Genetic Disorders

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

2nd Year

**Subject:- BIO-CHEMISTRY**  
**PRACTICAL Paper 3** (UNIVERSITY PRACTICAL)  
**F.M.-50**

Method of estimation of glucose : Benedict's Reaction, Glucose oxidise.  
Method of estimation of Protein, Albumin.  
Method of estimation of urea  
Method of estimation of Creatinine  
Method of estimation of Cholesterol

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

2nd Year

**SUBSIDIARY SUBJECT - COMPUTER SKILLS**

**THEORY F.M.-20 (Hrs.-1.5hrs)**

**&**

**PRACTICAL F.M.-15**

**Basic Computer Course (BCC)**

1. **Communication using the Internet:** Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubleshooting.
2. **WWW and Web Browsers:** World Wide Web; Web Browsing softwares, Search Engines; Understanding URL; Domain name; IP Address; Using e-governance website.
3. **Communications and collaboration:** Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration; Instant Messaging; Netiquettes.
4. **Making Small Presentation:** Basics of presentation software; Creating Presentation/handouts.

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY2nd Year**SUBSIDIARY SUBJECT - PUBLIC HEALTH****THEORY F.M.-20 (Hrs.-1.5hrs)****&****PRACTICAL F.M.-15****Subsidiary Subject:- Public Health**

- 1) Concepts in Health & Disease
- 2) Basics in Epidemiology
- 3) Nutrition and Health
- 4) Environment and Health
- 5) Communication in Health
- 6) Demography and Family Planning with National Population Policy 2000
- 7) Essential Medicine and Rational use of Drug (RUD)
- 8) Health care Delivery System with National Health Policy 2000
- 9) Health Planning and Management
- 10) Hospital waste Management
- 11) Disaster management
- 12) National Rural Health Mission
- 13) National Health Programmes in India

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

2nd Year

**Subject:- Pathology (SEMINAR)**

**2ND Year**

**SEMINAR TOPICS :**

- A) Haematology- Anaemia, Haemophilia, Leukaemia, etc.
- B) Blood Banking - Rh Incompatibility, Importance of PCV, etc.
- C) **Hormonal Assay.**
- D) Cultivation of Micro-organisms.
- E) Isolation of viruses in Lab by Tissue Culture.

NOTE:- All students to attend Seminar.

XSS

Aug

view

cs

any

BL

h

h

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY3<sup>rd</sup> Year**Subject:- MEDICINE****THEORY (Paper---1) F.M.-70 (Hrs.-3 hrs)**DERMATOLOGY - Acne, Scabies, Boil, CarbuncleCARDIOVASCULAR SYSTEM

1. Introduction of Hypertension

RESPIRATORY SYSTEM

1. PULMONARY TUBERCULOSIS
2. Introduction OF BRONCHIAL ASTHMA
3. Introduction OF CHRONIC BRONCHITIS
4. Introduction OF PNEUMOCOCCAL PNEUMONIA

EXCRETORY SYSTEM

1. Introduction OF RENAL FAILURE

NERVOUS SYSTEM

1. Introduction of MENINGITIS
2. Introduction of ENCEPHELITIS

HAEMATOLOGY

1. Introduction and Clinical features OF IRON DEFICIENCY ANAEMIA, MEGALOBlastic ANAEMIA

GASTRO INTESTINAL SYSTEM

1. MANAGEMENT OF DIARRHOEA and VOMITING

ENDOCRINOLOGY

1. Introduction and Clinical features OF DIABETES MELLITUS
2. Introduction and Clinical features OF HYPOTHYROIDISM

NUTRITIONAL DEFICIENCY DISEASES

Clinical features of the following deficiency diseases – protein, energy, Vitamin A, Vitamin B Complex, Vit. C and Vit. D

COMMON DISEASES

- Typhoid
- Malaria
- Kala-azar
- Dengue fever

Note:- Short term posting in Medicine Department for practical knowledge.

NO L UNIVERSITY PRACTICAL EXAM

Contd. Pg.no.....28

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY** 3rd Year  
**Subject:- MICROBIOLOGY THEORY (Paper---2-a) F.M.-35 (Hrs.-1.5 hrs)**

**COURSE CONTENTS :**

**1. Study of systematic Bacteriology**

- Streptococci
- Staphylogocci
- Pneumococci
- Corynebacteria
- Escherichia
- Klebsiella
- Enterobactor
- Proteus
- Salmonella
- Shigella
- Cholera

**2. Introduction of Anaerobic & Aerobic culture media**

**3. Fungus**

- General description of Fungus
- Lab. Diagnosis of fungal diseases
- Superficial mycosis

**4. Virus**

- Lab diagnosis of viruses--Molecular method of viral diagnosis

**5. Parasitology-**

**(a) Protozoa**

- Malaria Parasite
- Toxoplasma Gondii
- Balatidium Coli

**(b) General introduction, life cycle, mode of transmission , pathogenicity, and lab diagnosis of Various Helminths:**

**(i) Cestodes or Tapeworms :**

Taenia sodium  
Taenia saginata  
Hymenolepis nana  
Echinococcus granulosus

**(ii) Flukes:**

Fasciola hepatica  
Fasciola gigantica  
Gestrodiscoides hominis

**(iii) Nematodes:**

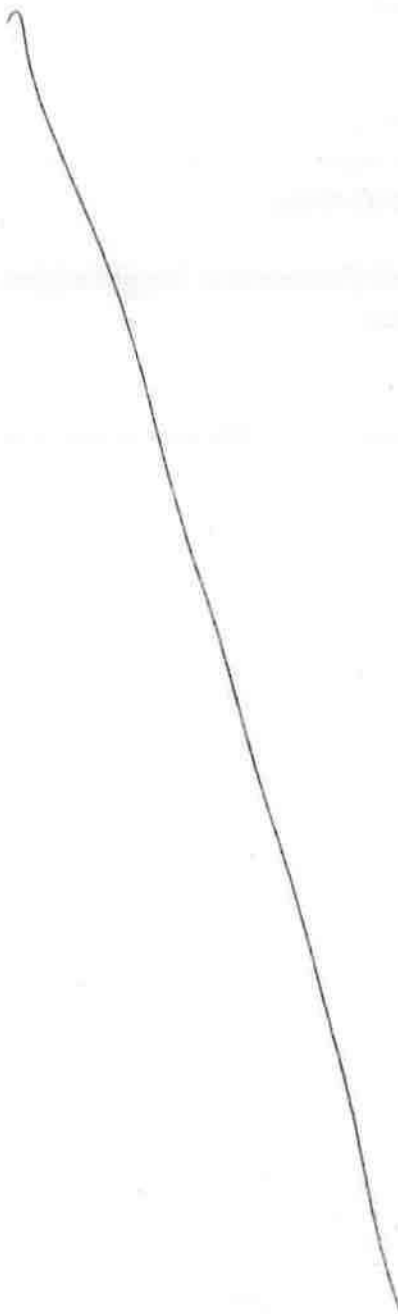
Trichinella spiralis  
Trichuris trichiura  
Ancylostoma duodenale  
Enterobius vermicularis  
Ascaris lumbricoides

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY3rd Year

Subject:-MICROBIOLOGY (Paper IIA)  
Practical F.M.-25

Staining characters of different type of Bacteria Identification of type colony growth  
Biochemical character of Organism

- Biochemical Test used for identification of bacteria
- Lab Diagnosis of Fungi
- Smear preparations



h H vas es Any DL h

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

3rd Year

Subject:-BIOCHEMISTRY      THEORY    (Paper---2-b)    F.M.-35    (Hrs.-1.5 hrs)

**COURSE CONTENTS**

- 1) Carbohydrates metabolism
  - Gluconeogenesis
  - Glycogenesis and its regulation
  - Glycogenolysis and its regulation
  - GTT (Glucose Tolerance Test)
  - Insulin Tolerance Test
- 2) Protein
  - Detection of Total Serum Protein
  - Detection of Serum Albumin and Globulin, A/G ratio
  - Disorders of amino acid metabolism
- 3) Lipids
  - Determination of total Blood Cholesterol; Tri-glycerides, HDL, LDL, VLDL and their Clinical significance
- 4) Haemoglobin Metabolism
- 5) Iodine Metabolism
  - Hypo and Hyper Thyrodism; T<sub>3</sub>, T<sub>4</sub>, TSH and Clinical significance
- 6) Gastric juice.
  - Importance
  - Constituents
  - Collection
  - Gastric analysis
- 7) Specials Profiles :
  - Glucose Tolerance Test
  - Insulin Tolerance Test
  - Xylose absorption Test
- 8) Introduction of
  - Chromatography
  - Electrophoresis

3rd Year

**Subject:-BIOCHEMISTRY (Paper IIB)**

- Methods of estimation of Blood Sugar
- Methods of estimation of Bilirubin
- Methods of estimation of SGOT, GPT, Alkaline Phosphatase, Acid Phosphatase
- Demonstration of Chromatography and Electrophoresis
- ELISA and RIA

Contd. Pg.no.....32

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY****3<sup>rd</sup> Year****Subject:- GENERAL PATHOLOGY****THEORY (Paper---3) F.M.-70 (Hrs.-3 hrs)**

- I) **Anaemia's :**
- a) Definition and classification of Anaemia
  - b) Laboratory Investigations of
    - Microcytic Hypochromic Anaemia
    - Macrocytic Normochromic Anaemia
    - Haemolytic Anaemia
    - Aplastic Anaemia
- II) **Haemorrhagic Disorders - Definition and classification**
- Haemostasis and Coagulation Factors
  - Investigations and Lab Diagnosis
- III) **Leukaemia Disorders-**
- Definition and classification
  - Lab Diagnosis
- IV) **Hormones -Techniques**
- ELISA
  - ELISA for Bacterial & Viral diseases
  - RIA
- V) **Cytology**
- Fine needle Aspiration Technique
  - Staining
  - Papanicolaou Staining technique
  - Cytology Criteria of malignancy
  - Types of specimens, methods of collection and preparation of cell block.
  - Cytology in cervical, endometrial and ovarian cancer.
  - Cytology of C.S.F and effusions
  - Tumour marker -(Benign & Malignant)
- VI) **Immunocytochemistry**

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

3<sup>rd</sup> Year

**SUB.- PATHOLOGY**

**PRACTICAL (UNIVERSITY EXAM)**

**Paper 3 F.M.-50**

1. Osmotic Fragility Test
2. Bone Marrow Smears Preparation
3. ELISA for Bacterial & Viral diseases
4. RIA
5. Hormonal Assays
6. Fine Needle Aspiration Technique, Slide Preparation & Staining
7. Papanicolaou Staining Technique

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY3rd Year

**Subsidiary Sub. :- Pharmacology -**  
**THEORY (Paper---4-a) F.M.-35 (Hrs.-1.5 hrs)**

**Fundamentals of Pharmacology**

1. Definition of pharmacokinetic and pharmacodynamics.
2. Routes of administration of drugs.
3. Antihistaminic drugs - Chlorpheniramin, Cetrizine
4. Emergency drugs - Dexametharone, Hydrocortisone
5. Branchodialators - Amino phyline, theophyline
6. Local Anesthesia - lignocaine
7. Antibiotic drugs - Erythromycin, Azithral, Cephalexin, Floxacin Group

**NO UNIVERSITY PRACTICAL EXAM**

*[Handwritten signatures and marks]*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

3rd Year

**Subsidiary Sub. - Hospital Waste Management**

**THEORY (Paper---4-b) F.M.-35 (Hrs.-1.5 hrs)**

1. Introduction to Biomedical wastes
2. Classification and categories of hospital wastes
3. Routs of transmission of disease by biomedical waste
4. Safety measures
5. The laws regarding biomedical waste treatment
6. Collection and segregation of Biomedical wastes
7. Transportation and storage of Biomedical wastes
8. Disposable techniques
9. Awareness and education
10. Persons at risk, rag pickers

**NO UNIVERSITY PRACTICAL EXAM**

**BACHELOR OF MEDICAL LABORATORY TECHNOLOGY**

**4<sup>th</sup> Year**

**Subject :- CLINICAL PATHOLOGY + TOXICOLOGY**  
**THEORY (Paper---1) F.M.-70 (Hrs.-3 hrs)**

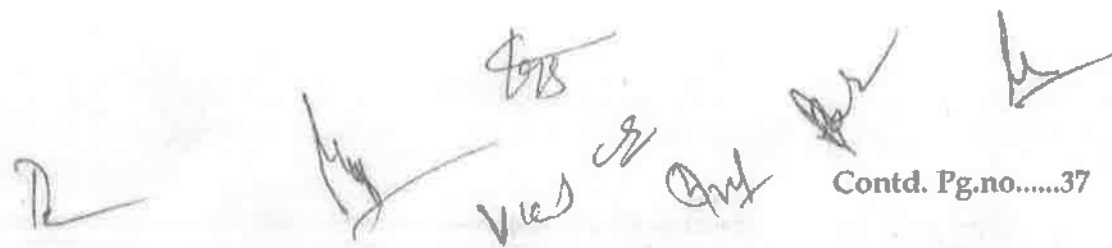
**(A) Examination of Body Fluid -**

1. Urine
  - a. Physical Examination
  - b. Chemical Examination for Protein, Sugar, Ketone bodies, Bile salts, Bile pigments and Blood
  - c. Microscopic examination of cells, casts, crystals and other deposits
2. Stool
  - a. Physical examination of colour, consistency and appearance
  - b. Chemical examination for occult blood
  - c. Microscopic examination for protozoa, parasites and helminthic ova or cysts
3. Examination of other body fluids
  - a. Cerebrospinal fluid
  - b. Ascitic fluid
  - c. Pleural fluid
4. Examination of semen
  - a. Physical character
  - b. Motility
  - c. Count

**(B) Study of following toxic substances - (Properties, Special features, fatal dose, fatal period, chemical analysis)**

- a. Sulphuric acid
- b. Nitric acid
- c. Hydrochloric acid
- d. Arsenic
- e. Organo phosphorus

**(C) Various Molecular methods like - ELISA, PCR, HYBRIDISATION, FLOWCYTOMETRY, PROBE**



BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th Year

**Subject :- Seminar 3<sup>rd</sup> Year**

**SEMINAR TOPICS :**

- A) Classification and Lab Diagnosis of Anaemia.
- B) Estimation of essential electrolytes- Sodium (Na), Potassium (K), Calcium(Ca), Phosphate(PO<sub>4</sub>) etc.

NOTE :- All students to attend Seminar.

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th Year

**Subject:- Clinical PATHOLOGY + TOXICOLOGY**

**PRACTICAL (UNIVERSITY EXAMINATION)**

**Paper - I F.M.-50**

**1. Urine examination**

**Physical examination, specific gravity, sugar, protein, ketone bodies, bile salts, bile pigments and blood**

**Microscopic examination**

**2. Stool examination**

**Physical chemical, microscopic examination**

**3. Examination of cerebrospinal fluid**

**4. Examination of semen**

*[A large handwritten line is drawn across the page, starting from the 'Examination of semen' section and extending towards the bottom right corner.]*

*[Handwritten signatures and initials are present at the bottom of the page, including 'B', 'M', 'VCS', 'es', 'Ant', and 'H'.]*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th Year

Subject:- Microbiology  
**THEORY** (Paper---2-a) F.M.-35 (Hrs.-1.5 hrs)

**Course contents :**

**1) Study of systematic bacteriology**

- Haemophilus
- Pseudomonas
- Mycobacterium
- Brucella
- Clostridia
- Treponema
- Niesseria
- Leptospira
- Mycoplasma
- Rickettessia
- Chlamydia

**2) Serology**

Principles and procedures of serologic test  
Widal, CRP, Agglutination test & ASO titre estimation  
Cold agglutination VDRL, TPHA

**3) Virus**

- (i) Lab. Diagnosis- Isolation of viruses.
  - (a) Animal inoculation
  - (b) Egg inoculation
  - (c) Chorioallointic membrane
  - (d) Tissue culture
- (ii) Immunoprophylaxis of viral diseases

**4) Fungus**

Deep Mycosis

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4<sup>th</sup> Year

**Subject:- MICROBIOLOGY**  
**PRACTICAL** **Paper - II A F.M.-25**

1. Staining
  - Grams staining
  - ZN staining of M.T.B. and M. Lepra
  - Albert staining
2. Culture
  - Type of media
  - Preparation
  - Inoculation
  - Colony characteristic
  - Staining and antibiotic sensitivity
3. Immunological tests
  - Slide Agglutination
  - VDRL
  - Widal
  - ASO
  - CRP

*[Handwritten signatures and marks at the bottom of the page]*

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th Year

**Subject:- BIOCHEMISTRY**  
**THEORY (Paper---2-b) F.M.-35 (Hrs.-1.5 hrs)**

1. Kidney function test
  - Urea, Uric acid, and Creatinine estimation
  - Test for renal blood flow
  - Test for glomerular function
  - Test for tubular function - concentration and dilution test
2. Lipids
  - Steroids (its formation and function)
  - Cardiac enzymes CPK, CPK- MB, LDH, Troponin, SGOT, SGPT
3. Electrolytes
  - Function, Properties
  - Clinical Importance
  - Electrometric determination of sodium and potassium
  - Sodium potassium pump
4. Introduction of
  - Radio immunoassay (RIA) - Principle and application
  - ELISA - Principle and application
  - PCR - Principle and application

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4<sup>th</sup> Year

**Subject:- BIOCHEMISTRY**

**PRACTICAL (University Exam)**

**Paper - II B (F.Marks - 25)**

Methods of blood urea estimation

Methods of serum creatinine estimation

Methods of serum uric acid estimation

Methods of Total cholesterol HDL, LDL, VLDL, Triglyceride estimation

Revision of all biochemical tests.

*[Handwritten signatures and marks]*

Contd. Pg.no.....43

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY4th Year

**Subject:- LABORATORY MANAGEMENT  
THEORY (Paper---3) F.M.-70 (Hrs.-3 hrs)**

- 1) Laboratory Planning, General Principles
  - Planning at different levels
  - Planning for Hospital Lab Services
  - Selection of Hospital Laboratory
  - Space requirement
- 2) Laboratory management Technique
  - General Principle
  - Component and function of Laboratory
  - Staffing the Laboratory
  - Job Specification
  - Work Schedule
- 3) Care of Laboratory Glassware, Equipment, Instruments and Chemical etc.
  - General Principle
  - Care and cleaning of Glassware
  - Care of equipments and instruments
  - Lab chemicals, their proper use and care
  - Labeling
- 4) Laboratory Safety
  - General principle
  - Laboratory hazards
  - Safety programmes
  - First Aid
- 5) Quality Control of Laboratory
  - Laboratory goals
  - Care of Laboratory equipments
  - Sterilization and Autoclave technique
  - Maintenance of equipments logbooks
  - Internal and external quality check
  - Disinfection techniques and waste disposal

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4<sup>th</sup> Year

**SUB.- LABORATORY MANAGEMENT**  
**PRACTICAL PAPER-III F.M.-50**

- Laboratory management -Sample collection, Labelling, Transport, Screening, Reporting and Dispatch of Reports
- Goods inwards note form
- Material note form
- Material requisition form

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4<sup>th</sup> Year

Subject – PROJECT WORK (F.M.50)

A project work in medical laboratory technology will have to be done in any concerned subject

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

Subject :- Seminar

4<sup>th</sup> Year

SEMINAR TOPICS :

- (A) Cytology criteria of malignancy.
- (B) Biochemical tests used for identification of bacteria.
- (C) Laboratory Management and Quality Control.

NOTE :- All students to attend Seminar.

### BOOKS FOR ANATOMY (TEXT & REFERENCE)

| <u>Name Of Books</u>                                   | <u>Author's Name</u> |
|--------------------------------------------------------|----------------------|
| 1) Understanding Human Anatomy & Physiology            | William Davis        |
| 2) A Text Book of Anatomy                              | Chaurasia            |
| 3) A Text Book of Human Anatomy                        | T.S. Rangnathan      |
| 4) Human Anatomy (Description & Applied)               | Fattana              |
| 5) Physiology and Anatomy with Practical consideration | ESTER .M Grishcimer  |

### BOOKS FOR PHYSIOLOGY (TEXT & REFERENCE)

| <u>Name Of Books</u>            | <u>Author's Name</u> |
|---------------------------------|----------------------|
| 1) Text Book of Physiology      | Guyton               |
| 2) Human Physiology             | Chatterjee           |
| 3) Concise Medical Physiology   | Choudhary            |
| 4) Review of Medical Physiology | Ganong               |

### BOOKS FOR BIO - CHEMISTRY ( TEXT & REFERENCE )

| <u>Name Of Books</u>                  | <u>Author's Name</u> |
|---------------------------------------|----------------------|
| 1) Bio-chemistry for Medical students | Vasudewan            |
| 2) Text book of Bio-chemistry         | Harper               |
| 3) Clinical Chemistry                 | Kaplan               |
| 4) Clinical Chemistry                 | Varley               |
| 5) Clinical Chemistry                 | TEITZ                |
| 6) Text book of Medical Biochemistry  | Ramakrishna          |
| 7) Biochemistry                       | Das                  |
| 8) Practical Biochemistry             | K. P. Sinha          |

### BOOKS FOR PATHOLOGY (TEXT & REFERENCE)

| <u>Name Of Books</u>                                     | <u>Author's Name</u> |
|----------------------------------------------------------|----------------------|
| 1) Henry's Clinical diagnosis & management               | Henry                |
| 2) Text book of clinical chemistry & molecular diagnosis | Tietz                |
| 3) Laboratory Technology                                 | Ramanic Sood         |
| 4) Laboratory Technology                                 | Gwadkor              |
| 5) Clinical Pathology & Bacteriology                     | Sachdev K. N.        |
| 6) Text book of Pathology                                | Krishna              |
| 7) Histopathology Techniques                             | Culling              |
| 8) Histopathology Techniques                             | Bancroft             |
| 9) Cytology                                              | Koss                 |
| 10) Diagnostic Cytopathology                             | Winfred Grey         |
| 11) Practical Haematology                                | Dacie & Lewis        |
| 10) Text book of Medical Laboratory For Technician       | Satish Gupta         |

### BOOKS FOR MICROBIOLOGY (TEXT & REFERENCE)

| <u>Name Of Books</u>                                | <u>Author's Name</u>                 |
|-----------------------------------------------------|--------------------------------------|
| 1) Medical Microbiology                             | Anathnarayana & Panikar              |
| 2) Essentials of Medical Microbiology               | Apurba Shankar Sastri & Sandhya Bhat |
| 3) The Practice of Medical Microbiology             | Roberty Cruickshank                  |
| 4) Parasitology-Interpretation to Clinical Medicine | Chatterjee                           |
| 5) Medical Mycology                                 | Rippon                               |
| 6) Medical Mycology                                 | Emmons                               |
| 7) Practical in Microbiology                        | Mandeepa Gupta & Malika Sengupta     |

### BOOKS FOR COMPUTER (TEXT & REFERENCE)

#### REFERENCE :

1. A. Mahsoor, "Internet and Web Design Made Easier," Pragma Publication.
2. B. Ram, "Computer Fundamentals.
3. T. N. Trainer, "Computer" McGraw Hill.

### BOOKS FOR ENGLISH (TEXT & REFERENCE)

#### REFERENCE

1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993
2. Wren and Martin - Grammar and composition, 1989, Chanda Inter & Co. Delhi
3. Letters for all Occasions, A S Myers. Pub - Harper Perennial
4. Spoken English V Shasi Kumar and P V Dhanija Pub by Tata McGraw Hill, New Delhi
5. Journalism Made Simple D Wainwright.
6. Writers Basic Book self Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon
8. Penguin Book of Interviews.

### BOOKS FOR Public Health (TEXT & REFERENCE)

- 1) Paarks texts book preventive and Social medicine
- 2) Text book of Community medicine
- 3) Health Policies and Programme in India

### BOOKS FOR HOSPITAL WASTE MANAGEMENT

- 1) Hospital waste management and its monitoring ,  
Madhuri Sharma - J.P. Brother's medical publisher(P) Ltd.

### BOOKS FOR MEDICINE

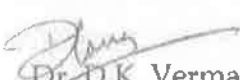
Davidson's text book of medicine

### BOOKS FOR PHARMACOLOGY

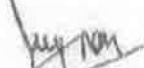
A short text book of pharmacology - Tripathi

### BOOKS FOR LABORATORY MANAGEMENT

Medical laboratories management - Sharma, Agarwal, Chaturwadi, Thakur  
Viva Books Pvt. Ltd. , New Delhi

  
Dr. D.K. Verma

  
Dr. V.K. Singh

  
Dr. R.T. Ram

  
Dr. U.S. Pandey

  
Dr. S.N. Sharma

