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

Contd. Pg.no.....02
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 & its Nerve supply
- Ear
- Nose
- Tongue
1. Labelled Diagram of different organs and bones
2. Surface Markings of the Body
3. Demonstration of Histological Slides-

NO UNIVERSITY EXAMINATION

Contd. Pg.no.....04
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
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.
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

1st 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

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Contd. Pg.no......06
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
   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

Contd. Pg.no......07
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.
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

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 1st 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

Contd. Pg.no.....10
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

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BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

Subject: BIOCHEMISTRY THEORY (Paper---(4-b)) F.M.-35 (Hrs.-1.5hrs)

1st Year

(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.

(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.
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

Contd. Pg.no.....12
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
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: Benedict's 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

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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:
Practice 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
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY 1st 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.
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 TECHNOLOGY
Sub: Pathology Practical (ONLY INTERNAL) 2nd Year 1st 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

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Contd. Pg.no.....18
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

   - 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) Leishmenia donovani

Contd. Pg.no.....19
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

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
• COOMB'S test
• Anti D Titre
• LE Cell Preparation
• Electrophoresis Technique – Protien & 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.
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

Contd. Pg.no.....23
Method of estimation of glucose: Benedict's Reaction, Glucose oxidase.
Method of estimation of Protein, Albumin.
Method of estimation of urea
Method of estimation of Creatintine
Method of estimation of Cholesterol

Contd. Pg.no......24
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.

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY 2nd 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

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.
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

Subject: MEDICINE THEORY (Paper---1) F.M.-70 (Hrs.-3 hrs)

DERMATOLOGY - Acne, Scabies, Boil, Carbuncle

CARDIOVASCULAR 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.
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
          - Geotricoscoidees hominis
      (iii) Nematodes:
          - Trichinella spiralis
          - Trichuris trichiura
          - Anclylostoma duodenale
          - Enterobius vermicularis
          - Ascaris lumbricoides

Contd. Pg.no.....29
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
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; T3, T4, 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

Contd. Pg.no.....31
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

3rd Year

Subject: BIOCHEMISTRY (Paper IIB)
PRACTICA (University Exam) Full Marks — 25

• 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
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

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

Contd. Pg.no.....33
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

3rd 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
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, Floxacain Group

NO UNIVERSITY PRACTICAL EXAM
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. Routes 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

4th 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. Organophosphorus

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

Contd. Pg.no......37
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th Year

Subject :- Seminar

3rd Year

SEMINAR TOPICS:

A) Classification and Lab Diagnosis of Anaemia.

B) Estimation of essential electrolytes- Sodium (Na), Potassium (K), Calcium(Ca), Phosphate(PO4) etc.

NOTE: - All students to attend Seminar.
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
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

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) Chorioalointic membrane
       (d) Tissue culture
   (ii) Immunoprophylaxis of viral diseases

4) Fungus
   Deep Mycosis

Contd. Pg.no.....40
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

Contd. Pg.no.....41
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

Contd. Pg.no......42
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.
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

4th 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

Contd. Pg.no.....44
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY

SUB.- LABORATORY MANAGEMENT

PRACTICAL

4th Year

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

4th 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 4th 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)

<table>
<thead>
<tr>
<th>Name Of Books</th>
<th>Author’s Name</th>
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<tbody>
<tr>
<td>1) Understanding Human Anatomy &amp; Physiology</td>
<td>William Davis</td>
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<tr>
<td>2) A Text Book of Anatomy</td>
<td>Chaurasia</td>
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<td>3) A Text Book of Human Anatomy</td>
<td>T.S.Rangnathan</td>
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<td>4) Human Anatomy (Description &amp; Applied)</td>
<td>Fattana</td>
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<td>5) Physiology and Anatomy with Practical consideration</td>
<td>ESTER .M Grishcimer</td>
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### BOOKS FOR PHYSIOLOGY (TEXT & REFERENCE)

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<tr>
<th>Name Of Books</th>
<th>Author’s Name</th>
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<tr>
<td>1) Text Book of Physiology</td>
<td>Guyton</td>
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<td>2) Human Physiology</td>
<td>Chatterjee</td>
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<td>3) Concise Medical Physiology</td>
<td>Choudhary</td>
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<td>4) Review of Medical Physiology</td>
<td>Ganong</td>
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### BOOKS FOR BIO - CHEMISTRY (TEXT & REFERENCE)

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<td>1) Bio-chemistry for Medical students</td>
<td>Vasudewean</td>
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<td>2) Text book of Bio-chemistry</td>
<td>Harper</td>
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<td>3) Clinical Chemistry</td>
<td>Kaplan</td>
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<td>4) Clinical Chemistry</td>
<td>Varley</td>
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<td>5) Clinical Chemistry</td>
<td>TEITZ</td>
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<tr>
<td>6) Text book of Medical Biochemistry</td>
<td>Ramakrishna</td>
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<td>7) Biochemistry</td>
<td>Das</td>
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<td>8) Practical Biochemistry</td>
<td>K. P. Sinha</td>
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### BOOKS FOR PATHOLOGY (TEXT & REFERENCE)

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<td>2) Text book of clinical chemistry &amp; molecular diagnosis</td>
<td>Tietz</td>
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<tr>
<td>3) Laboratory Technology</td>
<td>Ramanic Sood</td>
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<tr>
<td>4) Laboratory Technology</td>
<td>Gwadkor</td>
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<tr>
<td>5) Clinical Pathology &amp; Bacteriology</td>
<td>Sachdev K. N.</td>
</tr>
<tr>
<td>6) Text book of Pathology</td>
<td>Krishna</td>
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<td>7) Histopathology Techniques</td>
<td>Culling</td>
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<td>8) Histopathology Techniques</td>
<td>Bancroft</td>
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<td>9) Cytology</td>
<td>Koss</td>
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<td>10) Diagnostic Cytopathology</td>
<td>Winfred Greg</td>
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<td>11) Practical Haematology</td>
<td>Dacie &amp; Lewis</td>
</tr>
<tr>
<td>10) Text book of Medical Laboratory For Technician</td>
<td>Satish Gupta</td>
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BOOKS FOR MICROBIOLOGY (TEXT & REFERENCE)

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<tr>
<td>1) Medical Microbiology</td>
<td>Anathnarayana &amp; Panikar</td>
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<tr>
<td>2) Essentials of Medical Microbiology</td>
<td>Apurba Shankar Sastri &amp; Sandhya Bhat</td>
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<tr>
<td>3) The Practice of Medical Microbiology</td>
<td>Robert Cruckshank</td>
</tr>
<tr>
<td>4) Parasitology-Interpretation to Clinical Medicine</td>
<td>Chatterjee</td>
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<tr>
<td>5) Medical Mycology</td>
<td>Rippon</td>
</tr>
<tr>
<td>6) Medical Mycology</td>
<td>Emmons</td>
</tr>
<tr>
<td>7) Practical in Microbiology</td>
<td>Mandeepa Gupta &amp; Malika Sengupta</td>
</tr>
</tbody>
</table>

BOOKS FOR COMPUTER (TEXT & REFERENCE)

REFERENCE:
1. A. Mahsoor, "Internet and Web Design Made Easier," Pragya Publication.
2. B. Ram, "Computer Fundamentals.

BOOKS FOR ENGLISH (TEXT & 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
4. Spoken English  V Shashi 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

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