

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B.Sc.

Medical Technology (Sp.)

Paper No.VI Clinical Microbiology & Immunology

Unit 1 Principles of human-microbe interactions

- (i) Microorganisms and human body: normal microbiota
- (ii) Infection and disease: Type of pathogens, Koch's Postulates, virulence factors, Establishment of infection or disease, Signs and symptoms of disease, Kinds of disease, Spread of infectious diseases.
- (iii) Nonspecific and specific host defenses: Physical barriers, cellular defenses, inflammation, fever, molecular defenses

Unit 2 Epidemiology and Nosocomial infections

- (i) Epidemiology : Concept, terminology, tools of epidemiologist, Epidemiological analysis of diseases, collection of data, observational and experimental studies.
- (ii) Nosocomial infections: Source, surveillance, prevention and control, Nature of hospital pathogens

Unit 3 Disease of Skin, Wound and Bite

- (i) Scalded skin syndrome, Scarlet fever & Erysipelas
- (ii) Mumps, Measles, Rubella
- (iii) Dermatomycoses
- (iv) Gas gangrene
- (v) Surgical and burn wound infections

Unit 4 Diseases of respiratory tract

- (i) Pharyngitis and tonsillitis
- (ii) Diphtheria
- (iii) Pertussis
- (iv) Tuberculosis
- (v) Pneumonia
- (vi) Q fever
- (vii) Common cold
- (viii) Influenza

Unit 5 Diseases of Gastrointestinal Tract

- (i) Bacterial food poisoning
- (ii) Enteric fever - Typhoid and paratyphoid
- (iii) Bacillary and Amoebic dysentery
- (iv) Cholera
- (v) Traveler's diarrhoea
- (vi) Pseudomembranous colitis
- (vii) Enteritis by Campylobacter and Yersinia
- (viii) Helicobacter infection
- (ix) Hepatitis

Unit 6 Diseases of Cardiovascular lymphatic and other system

- (i) Bacteremia and septicemia
- (ii) Rheumatic fever
- (iii) Leprosy
- (iv) Tetanus
- (v) Plague
- (vi) Anthrax
- (vii) RMSF
- (viii) Malaria & Filaria
- (ix) Rabies
- (x) Poliomyelitis
- (xi) Meningitis & Encephalitis
- (xii) Leptospirosis

Unit 7 Diseases of Urinary and Reproductive System

- (i) Syphilis
- (ii) Gonorrhoea
- (iii) Toxic shock syndrome (TSS)
- (iv) Urinary Tract Infections
- (v) Bacterial Vaginitis
- (vi) Genital Herpes
- (vii) AIDS

Unit 8 Immunology and Immunization

- (i) The acquired immune system: Characteristics,
- (ii) Antigens, haptens and epitope, chemical nature and classification of antigens
- (iii) Antibodies: Structure, characteristics of immunoglobulins,
- (iv) Types of immunity
- (v) Immunological reactions and their applications: Agglutination, precipitation, conjugated antigen / antibody tests and, Immunodiffusion, immunoelectrophoresis, Immunofluorescence
- (vi) Immunization: Types and Vaccine administration schedule in India

Unit 9 Immunological disorder

- (i) Immunodeficiency: Mechanism of immunosuppression
- (ii) Hypersensitivity - Immediate and delayed type, Anaphylactic reaction
- (iii) Autoimmune disorder: Autoimmune haemolytic anemia

Unit 10 Antimicrobial chemotherapy

- (i) Development of chemotherapy
- (ii) Characteristic of antimicrobial agents
- (iii) Mechanism of action of antimicrobial agents
- (iv) Drug resistance
- (v) Antifungal, antiviral and antiparasitic drugs
- (vi) Antibiotic sensitivity tests
- (vii) Therapeutic use of antimicrobial agent

REFERENCE BOOK

1. Mackie & McCartney Practical Medical Microbiology, 14e, J.G. Collee, A.G. Fraser, B.P. Marmion and A. Simmins, 1996, Churchill Livingstone
2. Medical Microbiology; A guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Diagnosis and Control, 15e, David Greenwood, Richard Slack, J. Peutherer, 1998, ELST with Churchill Livingstone.
3. Infectious Disease, B.A. Bannister, N.T. Begg & S.H. Gillespie, 1996, Blackwell Science
4. Diagnostic Microbiology, Finegold and Martin, 6th ed., The C.V. Mosby Co.
5. Bailey and Scott's Diagnostic Microbiology, Sydney M. Finegold and Eelln Jo Baron, 7th ed., The C.V. Mosbey Co.
6. Microbiology, Pelczar, Reid chan, 4th ed., Tata McGraw Hill Publishing Co. Ltd.
7. Manual of Clinical Microbiology, Murray, Baron, Pfaller, Tenover, Tenover, 6th ed., American Society for Microbiology.
8. Medical Microbiology, Mims Cajhl Playfair
9. Microbiology Infection Control for Health Professions, Cary Lee & Peni Bishop, Printice Hill Publication.
10. Textbook of Immunology, James T. Barrett, 5th ed., The C.V. Mosby Company.
11. Essential Immunology, Irvan M. Roitt, 6th ed., ELBS and Blackwell Scientific Publication.
12. Immunology, R.D. Guttman, 1981, A Socpe Publication.
13. Use and Interpretation of tests in Clinical Immunology, James B. Peter, 8th ed., Speciality Laboratory Inc., USA.
14. Immunology, Richard M. Hyde, 3rd ed.(NMS), Indian Edition, Williams and Wilkins, Baltimore, Maryland.
15. Modern Immunology, A. Dasgupta, 2nd ed., 1992, Jaypee Brothers Medical Publisher.
16. Immunology, Weir, 7th ed., ELBS, Charchill Lingstone, ELBS students edition.
17. Modern Practice in Immunization, D.D. Banker, Universal Publishing Corporation, Mumbai.
18. Clinical Microbiology Procedure Handbook, Isenberg, ASM Press.
19. Medical Laboratory Science: Theory & Practice, J Ochei & A. Kolhatkar, Tata McGraw Hill Pub.

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Paper No.VII Clinical Pathology & Parasitology

Unit – 1 Clinical Pathology Laboratory

- (i) Instrumentation, Preparation of patient, Collection of various specimen and processing
- (ii) Laboratory procedure manual (Standard Operating procedures – S.O.P.)
- (iii) Laboratory safety (Biohazards, waste disposal, Universal precaution)
- (iv) Medicolegal aspects (CPA)
- (v) Automation in laboratory, Quality Control and assurance in various techniques
- (vi) Laboratory investigations – result interpretation, reagent preparation

Unit – 2 Urine Analysis – Indications & Clinical Correlation

- (i) Formation, Composition and collection procedures, Specimen preservation
- (ii) Routine physical (gross) examination and chemical screening
- (iii) Urine sediment examination (Microscopic)
- (iv) Automated urine analysis and Reagent strip methodology
- (v) Special urine testing procedures including Pregnancy test, Cytopathologic examination, Stone analysis, Screening for inherited metabolic diseases and other tests
- (vi) Evaluation of Renal Function Test, Test for urine- Specific gravity, pH, acid base balance, electrolytes, blood gases, nonprotein nitrogenous compound testing

Unit – 3 Body Fluids

- (i) Cerebrospinal fluid: Indications, formation, collection technique, composition, physical (gross), Chemical tests, microscopic & microbiologic examination findings in various diseases
- (ii) Pleural, peritoneal (Ascitic) and pericardial fluids: Indications collection, physical, chemical, microscopic examination with immunologic and microbiologic tests, clinical significance, transudate and exudate
- (iii) Synovial fluid: Indication, collection, physical, chemical, microscopic examination, clinical findings in various disease
- (iv) Sputum Analysis: Indications brief anatomy and physiology of Respiratory system, collection, physical, chemical, microscopic & microbiologic examination and clinical significance
- (v) Gastric analysis: Indications and clinical significance, Anatomy Physiology of Stomach, gross, chemical & microscopic examination. Test to detect Helicobacter pylori staining procedure
- (vi) Tests for Amniotic fluid examination, pregnancy tests, chorionic villous examination for congenital and genetic disease
- (vii) Glucose Tolerance Tests: Collection, procedure, precaution, glycosylated hemoglobin estimation

Unit – 4 Examination of faeces

- (i) Indications, collection, Routine physical, chemical, microscopic examination
- (ii) Concentration techniques, clinical significance, preservation of specimen

Unit - 5 Semen analysis

- (i) Role in fertility assessment (Indications)
- (ii) Anatomy and physiology of reproductive system
- (iii) Formation, composition & collection. Routine physical, chemical & microscopic analysis
- (iv) Normal and abnormal morphology, oligo, azoospermia, liquefaction tests, etc.
- (v) Sperm function tests, sperm wash and cryopreservation
- (vi) Automated semen analysis and Medicolegal significance

Unit – 6 Histopathology Techniques

- (A) Fine needle Aspiration cytology – FNAC/FNAB
 - Indications, collection from various body fluids, Advantages, disadvantages, procedures
 - Precautions, complications, comparison with Frozen and Tissue biopsy technique
 - Clinical significance, H&E, May-grunwald, Giemsa and PAP staining technique
- (B) Tissue processing : Specimen types – biopsy procedures, labelling, collection, grossing and decalcification technique. Fixatives, fixation, clearing, dehydration, embedding and infiltration, block preparation, microtomy – various types
 - Microtome knife – types, sharpening and honing
 - Staining – Routine H&E and special stains for various tissue components
 - Automated tissue processing and staining techniques
 - Slide preparation, Microscopy – types, maintenance & cleaning

Unit – 7 Medical Parasitology

- (i) Clinical significance, introduction, classification, various specimens including Stool. Blood, sputum, urine, biopsy, aspirate, culture, swab, concentration technique, staining and preservation of specimen
- (ii) Aseptic and antiseptic methods of collecting specimens, Laboratory safety, quality control
- (iii) Study of parasites with morphology, life cycle and laboratory diagnosis

Unit – 8 Protozoa – morphology, life cycle, laboratory diagnosis

- (A) Blood & Tissue : (i) Plasmodium vivax, P.falciparum, P.malaria, P.ovale
 - (ii) Leishmania donovani, L.tropica, L.brasiliensis
 - (iii) Toxoplasma gondii
- (B) Intestinal & urogenital : (i) Entamoeba histolytica and Entamoeba coli
 - (ii) Giardia lamblia, Trichomonas vaginalis

Unit – 9 Helminthes – morphology, life cycle, laboratory diagnosis

- (A) Nematodes - Intestinal
 - Ascaris lumbricoides, Ancylostoma duodenale
 - Necator americanus, Strongyloides stercoralis
 - Enterobius vermicularis, Trichuris trichiuriaSomatic – Wuchereria bancrofti, Brugia malayi, Dracunculus medinensis
- (B) Cestodes :- Taenia saginata, Taenia solium, Hymenolepis nana, Diphyllobothrium latum, Echinococcus granulosus

(C) Trematodes :- Schistosoma haematobium, S.mansoni, S.japonicum, Fasciola hepatica, F.buski, Clonorchis sinensis, Paragonimus westermani

Unit – 10 Parasite infections in immunocompromised hosts and tissue parasites

- (i) Immuno compromised host : (i) Cryptosporidium (ii) Toxoplasma gondii
(iii) S.stercoralis (iv) Leishmania (v) A.trypanosomiasis – Chagas disease
- (ii) Tissue Helminths : (i) Filaria (ii) Onchocerca volvulus (iii) Loa loa (iv) D.medinensis (v) T.spiralis (vi) E.granulosus (vii) T.solium and T.saginata
(viii) F.hepatica (IX) S.mansoni & Japanicam

REFERENCE BOOK

1. Clinical Diagnosis and Management by Lab. Methods, John Bernard Henry, 20th Ed., W.B. Saunders Co.
2. Textbook of Medical Laboratory Technology, P.B. Godkar, Bhalani Publishers, Mumbai, (Latest Edition)
3. Medical laboratory Technology, Vol.I,II & III, K.L. Mukherjee, Tata McaGraw Hill, Latest Edition.
4. Medical Laboratory Technology, Ramnik Sood, Jaypee Brothers, Latest Edition.
5. A Handbook of Clinical Pathology, Chakraborty & Bhattacharya, Academic Publisher.
6. Medical Parasitology , K.D. Chaterjee, Chaterjee Medical Publisher, Latest edition.
7. Diagnostics Medical Parasitology, L.S. Gracia & D.A. Brukner, ASM Press.
8. Diagnostic Pathology of Parasitic Infections with Clinical Correlation; Y Gutierrez, Lea and Febiger publishers 1990 Ed. London.

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Paper - VIII Clinical Biochemistry & Enzymology

Unit 1 INTRODUCTION OF CLINICAL BIOCHEMISTRY

- (i) Introduction
- (ii) Use of Biochemical investigations in the different fields of sciences
- (iii) Biochemical investigations- Human health
- (iv) Utility of Biochemical Investigations, Core Biochemical Investigations (Routine), Specialized investigations, Emergency tests

- (v) Infrastructure facilities of Clinical Biochemistry Laboratory including human resources., In larger set up, In smaller set up
- (vi) Automation and Clinical Laboratory.

Unit 2 SPECIMEN HANDLING AND REPORTING OF DATA

- a) Specimens
 - (i) Type of specimens used in the Biochemical Laboratory, Blood specimens, Urine specimens, Faecal specimens, Other body fluid specimens
 - (ii) Collection of Specimens
 - (iii) Anticoagulants and Preservatives
 - (iv) Labeling and storing of samples
 - (v) Transportation of Samples
 - (vi) Precautions while handling specimens
 - (vii) Hazards of specimen handling

- b) Analyzing and Reporting of data
 - (i) Expression of Biochemical results
 - (ii) Reference values
 - (iii) Variation in results and factors affecting the reporting of results.
 - (iv) Precision and accuracy
 - (v) Sensitivity and Specificity
 - (vi) Responsibility and morality while reporting results
 - (vii) Quality control aspects

Unit 3 INVESTIGATION OF DISORDERS OF CARBOHYDRATE METABOLISM.

- (i) Plasma or blood glucose : Regulation of blood glucose, Sample collection, various methods, Fasting, Postprandial and random sample analysis, Glucose tolerance tests
- (ii) Diabetes Mellitus : Types of Diabetes mellitus, Metabolic changes in Diabetic subjects, Investigations other than blood glucose, useful in the subjects undergoing treatment for diabetes, Glycosuria, Hyperglycemia and Hypoglycemia, Diabetic ketoacidosis
- (iii) Estimation of glucose in other body fluids
- (iv) Qualitative analysis of urine in diabetic subjects

Unit 4 PLASMA LIPIDS AND LIPOPROTEINS

- (i) Types of lipids present in plasma : Various methods of Cholesterol and Triacylglycerol and interpretation of results
- (ii) Other types of lipids
- (iii) Lipoproteins : Classification, Brief aspects of metabolism, Methods of estimation of various lipoproteins, Clinical correlation, Atherosclerosis and related aspects

Unit 5 PROTEINS IN HEALTH AND DISEASE

- (i) Plasma proteins : Different types of plasma proteins, Separation and Estimation of plasma proteins using different methods, Interpretation of results, Significance of A/G ratio, Brief account of other plasma proteins i.e., α, β, γ globulins and fibrinogen, Electrophoretic pattern of protein fractions in health and disease.
- (ii) Urinary proteins : Qualitative and quantitative estimation of urinary proteins, Interpretation of analytical data, Bence-Jones proteins and their estimation and significance., Proteins in other biological fluids including CSF

Unit 6 PLASMA ENZYMES AND DIAGNOSTIC UTILITY

- (i) An introduction to clinical enzymology
- (ii) Enzymes and Clinical Biochemical Laboratory : Enzymes as diagnostic reagents, Enzymes in the diagnosis of disease ; Functional plasma enzymes, Non-functional plasma enzymes, Factors affecting the enzyme levels in plasma, Abnormal plasma enzyme activities; Amylase, Lipase, ALT, AST, LDH, Alkaline Phosphatase, Acid Phosphatase, CPK, GGT, Cholinesterase, G-6-PD.
- (iii) Isoenzymes : Separation methods and diagnostic importance

Unit 7 FLUID AND ELECTROLYTE BALANCE

- (Sodium, Potassium, Chloride, Bicarbonate, Calcium, Lithium)
- (i) Methods of estimation in plasma and other biological fluids.
 - (ii) Clinical features of electrolytes and water disturbances

Unit 8 ACID- BASE BALANCE

- (i) pH and Buffers
- (ii) Concepts and Vocabulary
- (iii) Terminology
- (iv) Different methods of estimation of pO_2 , pCO_2 , pH and other parameters: Collection of samples, Precautions, Reference ranges
- (iv) Acid base disorders :Metabolic acidosis, Metabolic alkalosis, Respiratory acidosis, Respiratory alkalosis

Unit 9 FUNCTION TESTS

- (i) Liver Function tests : Functions of liver, Tests based on; Carbohydrate metabolism, Protein metabolism, Lipid metabolism, Bilirubin and Bile pigment metabolism, Detoxication and excretion, Enzymes
- (ii) Renal function tests: Functions of kidney, Serum parameters, Urinary parameters, Clearance tests, Tests related to the detection of presence of urinary calculi.
- (iii) Cardiac function tests: Lipids, Enzymes

- (iv) Gastric and Pancreatic function tests: Serum amylase, Serum Lipase
- (v) Thyroid function tests :T₃, T₄, TSH

Unit 10 BIOCHEMISTRY OF HORMONES

- (i) Introduction and classification of hormones
- (ii) Mechanism of action of hormones
- (iii) Individual hormones and their physiological functions
- (iv) Hormones and diseases

REFERENCE BOOKS

1. Clinical Chemistry ; Interpretation & Results, Alex Kaplan, Lavernfl Szabo, Lee & Febiger
2. Textbook of Medical Biochemistry, 3e, S. Ramkrishnan, K.G. Prasannan & S. Rajan, Orient Longman.
3. Medical Laboratory Technology, Vol.I,II & III, K.L.Mukherjee, 1997, Tata McGraw Hill.
4. Medical Laboratory Technology (Methods & Interpretation), Ramnik Sood, 5e, Jaypee Brother.
5. Practical Clinical Biochemistry, Harold Varley, Indian Edition, 1990, Anold Heinemann.
6. Handbook of Medical Laboratory Technology, Chitra Bharucha & others, 1987, A.H. Press, Vellore.
7. Textbook of Medical Laboratory Technology, P.B. Godkar, 1994, Bhalani Publishing House.
8. Tietz Textbook of Clinical Chemistry, 3e, Bartis & Ashwood, W.B. Saunders Co.
9. Fundamental of Clinical Chemistry, 4e, N.W. Tietz, W.B. Saunders Co.
10. Clinical Chemistry, 3e, Kaplan & Psce, The C.V. Mosbey Co.
11. Practical Biochemistry: Principles & Technique, 5e, Keith Wilson & John Walker, Cambridge University Press.
12. Biochemistry, U. Satyanarayan, Books and Allied Pvt. Ltd.

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Paper IX Haematology & Blood Banking

Unit- 1 Blood collection

- (i) Introduction
- (ii) Types of Samples required
- (iii) Anticoagulants for Blood collection
- (iv) Capillary and Venous Blood
- (v) Storage of Samples

Unit-2 Haemoglobin

- (i) Structure of Haemoglobin Molecule
- (ii) Types of normal Human Haemoglobin
- (iii) Estimation of Haemoglobin
- (iv) Abnormalities of Haemoglobin Molecule

Unit-3 Red Blood Cells, White Blood Cells and Platelets

- (i) Normal Erythropoiesis
- (ii) Total R.B.C. counting
- (iii) Morphological abnormalities of R.B.C. & its significance
- (iv) Normal Leucopoiesis
- (v) Normal W.B.C. count
- (vi) Morphological abnormalities of W.B.C & its significance
- (vii) Normal Platelet count and methods
- (viii) Formation and functions of Platelets

Unit-4 Differential W.B.C. Count

- (i) Preparation of Peripheral Smear
- (ii) Staining of Peripheral Smear
- (iii) Examination of different Leucocytes and doing Differential Count
- (iv) Normal and Abnormal Differential Count
- (v) Causes of Leucocytosis and Leucopenia

Unit-5 Anaemias and Leukaemias

- (i) Definition and Classification of Anaemias
- (ii) E.S.R and Blood Indices
- (iii) Iron deficiency and B12 deficiency Anaemias
- (iv) Sickle Cell Anaemia and Thalassemias
- (v) G6PD deficiency Anaemia
- (vi) Definition and Classification of Leukaemias
- (vii) Acute and Chronic Leukaemias
- (viii) Cytochemical reactions in diagnosis of different types of Leukaemias

Unit –6 Bone Marrow Study

- (i) Sites of Bone Marrow collection
- (ii) Preparation and Examination of Bone Marrow slides
- (iii) Normal Bone Marrow picture

Unit- 7 Bleeding and Coagulation defects

- (i) Introduction
- (ii) Tests to detect abnormalities of Haemostasis
- (iii) Tests for Coagulation defects
- (iv) Procedures for some commonly used tests for coagulation defects

Unit- 8 Blood Grouping

- (i) ABO and other types of Blood Grouping System, Weaker variants and clinical application
- (ii) Rh Blood Grouping system, partial/ Weak D Antigen and clinical application
- (iii) Major and Minor cross matching by Saline and Albumin techniques. Direct and Indirect Antiglobulin Tests

Unit- 9 Blood Donation

- (i) Selection of Donor, Tapping of the Donor
- (ii) Mandatory screening tests.(HbsAg, HCV, HIV1&HIV2) VDRL & Test for Malaria.
- (iii) Transfusion reactions and their Laboratory investigations

Unit- 10 Blood Components

- (i) Production of Red Cell Concentrate (Packed Cells)
- (ii) Fresh Frozen Plasma
- (iii) Platelet Concentrate

REFERENCE BOOK

1. Haematology, 2nd ed, 1995, Hoffman,NMS Hematology US Edition.
2. Immunohaematology, C.M. Zmijewski, Printece Hall of India.
3. Haematologicals Laboratory Methods, Edited by E. Merk.
4. Clinical Haematology, M.M. Wintrobe, Kothari's Indian Edition.
5. Practical Haematology, J. A. Dacie & S. M. Lewis, The English Language book Society, 8 ed, ELBS.
6. Hand Book of Medical Laboratory Technology, Bharucha, Meyerm Moody, Carman, Vellore.
7. Technical Manual, American Association of Blood Banks, 1996.
8. Quality Control in the Blood Bank, B.A.Myhre, American Society of Clinical Pathology.
9. Blood Bank Procedure Mannual, Grady Memorial Hospital Lindu Hart, 1976.
10. Technical Methods & Procedures of the Americal Associated Of Blood Bank, 6th ed.

PRACTICALS

(A) Clinical Microbiology & Immunology

1. Collection, handling and transport of clinical specimens for bacteriological analysis.
2. Diagnostic problems
3. Rapid identification of enteric pathogens by API 20E system (Demonstration)
4. Widal test - qualitative and quantitative tube and slide agglutination tests
5. Rheumatoid Arthritis test
6. Pregnancy test by latex haemagglutination technique
7. Diagnosis of syphilis by VDRL and RPR tests
8. ELISA test for HBsAg or antibody (Demonstration)

(B) Clinical Pathology & Parasitology

9. Urine analysis – Physical, Chemical, Microscopic, Microbiologic
10. Stool analysis - Physical, Chemical, Microscopic, Microbiologic & Concentration Technique
11. CSF analysis – Physical, Chemical, Microscopic, Microbiologic
12. Sputum analysis – Physical Microscopic & Microbiologic – AFB – Direct Concentration technique.
13. Semen analysis – Physical, Chemical, Microscopic.
14. Body fluid – Pleural, Peritoneal, synovial – Physical, Chemical, Microscopic.
15. FNAC smear staining – (i) PAP smear stain (ii) May grunvald giemsa for cytology.
16. Section cutting, fixation & routine tissue processing
Staining – Hematoxylen & Eosin Stain
17. Lab. Study of parasites present in (i) Stool (ii) urine (iii) blood – Jasbirsingh Jasbirsingh Bhattacharji (JSB) stain for malarial parasites

(C) Clinical Biochemistry & Enzymology

QUALITATIVE ANALYSIS

18. Analysis of body fluids including cerebrospinal fluid
19. Tests to detect the purity of fats and oils

QUANTITATIVE ANALYSIS

- 20 Estimation of blood sugar; Chemical methods and Enzymatic methods. Glucose Tolerance Test.
21. Serum Urea and Blood Urea Nitrogen (BUN) ; Chemical Methods and Enzymatic methods
22. Serum Creatinine and urinary creatinine; Jaffe's method and Modified Jaffe's method
23. Serum Uric acid; Chemical Methods and Enzymatic methods
24. Serum Cholesterol and HDL Cholesterol; Chemical methods and Enzymatic methods
25. Serum Triacylglycerols (TG); Chemical methods and Enzymatic methods
26. Serum Lipoproteins & proteins; Chemical methods
27. Serum Total Proteins - Biuret method
28. Serum Albumin - Bromocresol green method
29. Serum Calcium - Chemical methods
30. Serum Phosphorus
31. Serum Iron and TIBC (Total Iron Binding Capacity)
32. Serum Sodium, Potassium and Chloride; Chemical methods, Using Flame Photometer
33. Serum Bicarbonate; Chemical method

34. Serum Total Bilirubin and Direct bilirubin; Malloy and Evelyn method
35. Serum Enzymes: Alanine transaminase, Aspartate transaminase, Alkaline Phosphatase, Acid Phosphatase, Amylase, Lactate Dehydrogenase and its isoenzymes; Chemical and Kinetic methods
36. Screening tests using various strips (Demonstration)
37. Blood gas analyzer and analysis of urinary and bile stones (Demonstration)

Heamatology & Blood Banking

38. Methods of blood collection
39. Haemoglobin estimation by Sahil's and by Cyanmethaemoglobin method
40. Complete blood cell count
41. E.S.R. and packed cell volume
42. Sickling test
43. Test for bleeding and clotting time
44. Test for Prothrombin Time
45. ABO and Rh blood grouping
46. Anti-human globulin test
47. Anti A / Anti B saline methods titres
48. Rapid test for detection of HbsAg and HIV antibodies

REFERENCE BOOKS

1. Medical Laboratory Technology, 1999, Vol.I, II & III, K.L. Mukherjee, Tata McGraw Hill.
2. Textbook of Medical Laboratory Technology, P.B. Godkar, 1994, Bhalani Publishing House.
3. Medical Laboratory Technology (Methods & Interpretation), Ramnik Sood, 5e, Jaypee Brother.
4. Practical Clinical Biochemistry, Harold Varley, 4e, CBC Publishing.
5. Practical Clinical Biochemistry: Methods and Interpretation, 2e, Ranjan Chawla, Jaypee Brothers.
6. Handbook of Medical Laboratory Technology, Chitra Bharucha, Carmann, Mody 1987, A.H. Press, Vellore.
7. Practical Haematology, 8e, Dacie & Lewis, The English Language Book Society, ELBS
8. Handbook of Clinical Pathology, Chakraborty & Bhattacharya, Academic Publisher.
9. Parasitology, H.D. Chaterjee, Chaterjee Medical Publishers.
10. Basic Laboratory Methods in Medical Parasitology, WHO, 1991.
11. Practical Haematology, J. A. Dacie & S.M. Lewis, The English Language Book Society, 8th ed., ELBS.
12. Collection and Handling of Laboratory Specimens - A practical guide, 1983, Editor T. M. Slockbower and T. A. Bhumenfeld, J. B. Lippincott Company, USA.
13. Laboratory Manual Workbook in Microbiology, 7e, Jamorello, McGraw Hill Publishing.
14. Lynch's Medical laboratory Technology, 3e, Ramphael, W.B. Saunders Co.
15. Medical Laboratory Science: Theory & Practice, J Ochei & A. Kolhatkar, Tata McGraw Hill Pub.

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Third Year B.Sc.

Medical Technology (Sp.)

(In force from June 2003)

A student offering Medical Technology as a special subject will study papers VI, VII, VIII & IX and practicals based on these papers.

The teaching periods per week for 4 papers are 12 and there are 12 periods per week of practicals. Each period is of 55 minutes.

A Student offering Medical Technology, as a Special Subject will study Can subject – Instrumentation and Laboratory Managements.

The university examination of each paper will be of 3 hours duration. The total marks of the 4 papers are 280 (70 + 70 + 70 + 70=280) for university examination and 120 marks for internal examination, presence and assignment work. The university practical examination is of 140 marks and 60 marks for internal evaluation. The duration of practical examination will be of 28 hours, distributed over a period of 4 days.

The students shall record the practicals in the journal and get it signed regularly by the staff members. The journal certified by the head of the department should be produced at the time of annual examination along with at least 15 permanent slides and both shall be taken into consideration while assigning the marks.

Each candidate will be required to undergo a minimum of four weeks training at the end of the first term in a designated laboratory i.e. Government or Semi Government or Multifaculty Hospitals run by a trust or a reputed clinical laboratory headed by qualified Pathologist (M.D. Path.), so as to cover all the techniques & training pertaining to each paper (one week in each specialty). A satisfactory completion certificate from the chief of the said laboratory would be a prerequisite for the student to appear in the final year examination. Alongwith the certificate the student should submit the work report duly signed by the chief of the laboratory to the Head of the Department.