



BACHELOR IN MEDICAL LAB TECHNICIAN (BMLT)

3 Years Degree Course

-: REGULATION:-

The objective of the courses

1. The training of the candidate registering for various degree (3 years) courses are aimed to carry out all routine diagnostic / therapeutic test on modern hospital laboratory.

2. The Degree course is of three years

3. Eligibility for admission in all Para medical Degree courses.

The candidate must have passed 10+2 with at least 40% marks in aggregate of Physics Chemistry and Biology (P C B) and for BMLT 10 + 2 (P C B) or 10 + 2 vocational (M L T) course with at least 40% marks will also be eligible

4. In case of SC/ST/OBC candidates, 5% marks relaxation will be given for the admission in above said courses 5. Weight age will be given as per university rules

6. Number of seats will be 50 in each course

7. The minimum age for admission shall be 17 years on 31 December of the Academic year of admission 8. The selection of candidate will be on the basis of the entrance examination or in the absence of entrance exam, purely on merit list prepared on the basis of marks obtained in qualifying examination

9. The admissions of students into various programs should be completed by 30th November. There shall be minimum 240 teaching days in one academic year.

10. Attendance of students: The student should have 75% attendance in theory and 75% attendance in practical to be eligible to appear in university examination. However, only Dean/ Principal of the college are empowered to condone 10% of attendance on valid grounds. Monthly attendance of students has to be sent to the university every month from the respective affiliated colleges.

11. Total Course Duration: A student has to complete the course that he/she has joined with in the double the duration of the actual time taken for the completion of the course.

12. Medium of instruction and examination: the medium of instruction will be English

13. For all the Degree courses (which is of three years duration) at the end of first year, an Internal examination will be conducted at the college level itself and the result has to be sent to the University as per the scheduled notification.



14. Passing Marks of Examination:

- The passing marks of examination would be 50% for each subject and also in total marks obtained for Degree courses. The candidate has to pass in theory and practical examination separately. For theory paper the internal assessment marks, viva-voce and theory examination marks will be counted.
- The candidate should pass separately in two heads i.e In Theory (Theory plus Viva voce plus Internal Assessment) and also in Practical (with 50% marks).
- The candidate has to pass separately in each subject in internal assessment examination (with 50% marks) in order to be eligible to appear in university examinations.
- Regarding Grace marks it was decided that total weight age of grace marks would be 5 (five), and that grace marks can be split between the subjects. There will not be any grace marks for the Practical examination.
- Grace marks will not be added to total marks of the candidate. In Supplementary examination also similar pattern of grace marks will be followed.

15. Re-totaling & Re-valuation (Review) both should be allowed as per the university

17. Other rules regarding conduct of examination will be as per the university REGULATION/notifications

18. Permission will be given to start the courses after the permission from M P Paramedical council (Department of Medical education, Government of M. P.)

19 . Syllabus and scheme of examination shall be decided by the board of studies and Academic council of the university from time to time as per guidelines from M P Paramedical council.

20. In order to be an examiner a faculty member should have minimum three years of teaching experience and not below the rank of the Assistant Professor and /or Demonstrator / Tutor.

21. The examination papers (Theory) will be evaluated centrally at the university



Code	Title of Papers	Internal Assessment		University Examination			Total
		Theory	Practical	Theory	Viva	Practical	
BMLT-101T	Biochemistry	50	50	100	50	50	300
BMLT-102T	Haematology & Clinical Pathology	50	50	100	50	50	300
BMLT-103T	Applied Histology	50	50	100	50	50	300
BMLT-104T	Medical Microbiology	50	50	100	50	50	300
TOTAL							1200

22. The examiner who evaluates the theory copy preferably be appointed as the external for practical examinations for the said course.

23. Degree students will be eligible for supplementary examination.

SCHEME FOR FIRST YEAR

Note: - For passing the Candidate shall have to obtain 50%, marks separately in theory plus Internal Assessment and Practical plus Viva Voce plus Internal Assessment.

BMLT – 1 year syllabus

BIOCHEMISTRY

Subject Code : BMLT-101

THEORY SYLLABUS

1 -Introduction to medical technology

Ethics ,responsibility,safety measures in biochemical lab
First aid and accident ,clining and care of general laboratory

2- Glass ware and equipments

Preparation and storage of distilled water, analytical balance and uses
Preparation of reagent and storage of chemical
Unit of Measurement and S.I. unit
Volumetric apparatus'- measurement and calibration
Radio Activity & isotopes and uses
PH, buffer solution ,osmosis, diffusion, dialysis and surfacetantion

3- Urine analysis and formation

Sugar ,protein ,bile pigments ketone bodies ,[porfobilinogen ,fecal



blood, collection of biological specimen, separation of serum plasma
disposable biological sample material

4- **Basic Statistic-**

Mean median mode –reference range definition and influencing factor
determination

5- **Volumetric analysis**

Chloride estimation, standard acid and base solution.

PRACTICES

- Demo And Instruction of glassware
- Analytical balance
- Colorimeter
- Centrifuge
- Auto analyzer
- flame photometer
- Solution preparation- standard molar, buffer
- Determination of Ph
- Urine analysis Occult blood, sugar, protein, bile salt, bile pigment, ketone bodies
- Distilled water preparation



HEMATOLOGY

Subject Code : BMLT-102

THEORY SYLLABUS

1-Hematology introduction, & laboratory organization

2- Formation of blood

3-Composition and function of blood

4-Various Anticoagulants, their uses, mode of action merit and demerits

5-Collection & preservation of blood

6-Hb

7-PCV

8-TLC

9-Platelets investigation

10-Normal and Absolute value in Hematology

11-Quality Assurance in Hematology

12-Romanowsky dyes

13-Smear preparation staining procedure

14-Morphology of normal blood cell and identification

15-ESR

16-Routine examination of urine

17-Examination of CSF

18-Examination of Semen

PRACTICAL

1. Basic requirements for hematology laboratory.
2. Glasswares for Hematology.
3. Equipments for Hematology.
4. Anticoagulant vial preparation.
5. Complete Blood Counts.
6. Determination of Hemoglobin.
7. TRBC Count by Hemocytometers.
8. TLC by Hemocytometer.
9. Differential Leukocyte count.
10. Determination of Platelet Count.
11. Determination of ESR by wintrob's.
12. Determination of ESR by Westergren's method.
13. Determination of PCV by Wintrob's.
14. Erythrocyte Indices- MCV, MCH, MCHC.
15. Reticulocyte Count.
16. Absolute Eosinophil Count.



17. Morphology of Red Blood Cells.
18. Basic requirements for hematology laboratory.
19. Glasswares for Hematology.
20. Equipments for Hematology.
21. Anticoagulant vial preparation.
22. Complete Blood Counts.
23. Determination of Hemoglobin.
24. TRBC Count by Hemocytometers.
25. TLC by Hemocytometer.
26. Differential Leukocyte count.
27. Determination of Platelet Count.
28. Determination of ESR by wintrob's.
29. Determination of ESR by Westergren's method.
30. Determination of PCV by Wintrob's.
31. Erythrocyte Indices- MCV, MCH, MCHC.
32. Reticulocyte Count.
33. Absolute Eosinophil Count.
34. Morphology of Red Blood Cells.

HISTOPATHOLOGY

HISTOLOGY

Subject Code: BMLT-103

THEORY SYLLABUS

1-Introduction

Histopathology and lab organization, equipment, uses of maintenance, hazards, safety precautions,
Compound microscope optical system magnification and maintenance

2-Anatomy and physiology

- Human body and integrated physiology
- Cell organization and function
- Skeletal system, bones, joints, and muscles
- Body fluids and their significance
- Blood morphology
- Respiratory system
- Cardiovascular system
- Alimentary system
- Liver structure
- Urinary system



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NH-12, BEHIND NISSAN MOTORS, HOSHANGABAD ROAD, MISROD BHOPAL (M.P.)
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- Male and female genital tract
- Nervous system
- Spleen, lymph node and RE system
- Endocrine gland

3- Fundamental and applied histology

- Reception, recording and labeling of specimen
- Fixatives
- Tissue processing
- Embedding media
- Decalcification
- Microtome's and their principle
- Microtome knife
- Fault, cause, and remedies of section
- Routine staining procedures
- Mounting media
- Dyes chemistry and practice

4- Cytology

- Exfoliative cytology
- Collection processing and staining

PRACTICAL

ANATOMY

1. Identification and description of all anatomical structures.
2. The learning of Anatomy is by demonstration only through dissected parts, slides, models, charts etc.
3. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).
4. Demonstration of skeleton - articulated and disarticulated.

PHYSIOLOGY

1. Measurement of pulse, blood pressure.
2. Identification of blood cells by study of peripheral blood smear & staining
3. Hemoglobin estimation by sahli's method
4. RBC count
5. WBC count.

HISTOLOGY



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- gross examination and fixation of specimen
- decalcification
- study of microtome
- section cutting of paraffin wax
- preparation of 70% alcohol
- Staining of tissue by H & E stain
- -Papanicolaou staining



MICROBIOLOGY Subject Code: BMLT-104

THEORY SYLLABUS

GENERAL MICROBIOLOGY

- 1. General characters and classification of Bacteria.**
- 2. Characteristics of Bacteria**
Morphology- Shape, Capsule, Flagella, Inclusion, Granule, Spore.
- 3. Growth and Maintenance of Microbes**
Bacterial division, Batch Culture, Continuous culture, bacterial growth- total count, viable count, bacterial nutrition, oxygen requirement, CO₂ requirement, temperature, pH, light.
- 4. Sterilization and Disinfection.**
Physical agents- Sunlight, Temperature less than 100⁰C, Temperature at 100⁰C, steam at atmospheric pressure and steam under pressure, irradiation, filtration.
Chemical Agents- Alcohol, aldehyde, Dyes, Halogens, Phenols, Ethylene oxide.
- 5. Culture Media**
Definition, uses, basic requirements, classification, Agar, Peptone, Transport Media, Sugar Media, Anaerobic Media, Containers of Media, Forms of Media
- 6. Staining Methods**
Simple, Grams staining, Ziehl-Neelsen staining or AFB staining, Negative Impregnation
- 7. Collection and Transportation of Specimen**
General Principles, Containers, Rejection, Samples- Urine, Faeces, Sputum, Pus, Body fluids, Swab, Blood.
- 8. Care and Handling of Laboratory Animals**
Fluid, Diet, Cleanliness, Cages, ventilation, Temperature, Humidity, handling of Animals, Prevention of disease.
- 9. Disposal of Laboratory/Hospital Waste**
Non-infectious waste, Infected sharp waste disposal, infected non-sharp waste disposal.

Virology

1. Introduction of medical Virology
2. Nomenclature and classification, characteristics of viruses
3. Collection, transport, processing and storage of sample for viral diagnosis



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Parasitology

1. Introduction of medical & safety
2. General characteristics and classification of protozoa
3. Laboratory procedure collection preservation and processing of sample for parasite stool/blood fluid/ tissue- biopsy.
4. Morphology and life cycle of intestinal protozoa, amoebae- giardia
5. Laboratory diagnosis intestinal protozoa infection- amoebae- giardia
6. Morphology and life cycle of trichomonas vaginalis, flagellates- E. gingivalis
7. Morphology and life cycle of hemoprotozoa malaria parasite
8. Laboratory diagnosis of malarial infection
9. General character and classification of medical helminthology
10. Morphology and life cycle nematodes, ascaris, enterobius, ancylostoma, stongiloides
11. Lab diagnosis of intestinal nematodes infection

Practical

Bacteriology

1. Demo and instruction of microscope, care, and maintenance.
2. Study of equipments and glassware used in microbiology lab.
3. Principle and method of sterilization
4. Preparation of culture media- nutrient and MacConkey Agar.
5. Preparation of culture plate and isolation of microorganisms.
6. Gram staining method of bacteria.
7. Sputum smear preparation and staining by Ziehl-Neelsen (AFB).
8. Preparation of broth and slant.
9. Inoculation of the microorganism from liquid medium.
10. Inoculation of the microorganism from slant culture to nutrient broth.
11. Study the mortality of bacteria.

Parasitology

1. Saline and pH preparation for Protozoal / Helminthiasis cysts.
2. Stool examination.
3. Study of life cycle and lab. Diagnosis of malaria parasites.

Virology

1. Study of viruses structure and morphology.
2. Study of sample collection for virology



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SCHEME FOR SECOND YEAR

		Internal Assessment		University Examination			
Code	Title of Papers	Theory	Practical	Theory	Viva	Practical	Total
BMLT-201T	Biochemistry	50	50	100	50	50	300
BMLT-202T	Cellular Pathology	50	50	100	50	50	300
BMLT-203T	Applied Haematology	50	50	100	50	50	300
BMLT-204T	Microbiology	50	50	100	50	50	300
TOTAL							1200

Note

Passing marks in all subject candidate must obtain 50% in aggregate with minimum of 50% in theory, including viva and minimum 50% in practical



BMLT-2 YEAR BIOCHEMISTRY Subject Code: BMLT-201

36. THEORY SYLLABUS

1. Chemistry of carbohydrates & their related metabolism -

- Introduction, definition, classification, digestion and absorption of carbohydrate,
- Qualitative test for carbohydrate identification. clinical aspects of carbohydrate.
- Metabolism
- Glycogenesis & glycogenolysis (in brief),
- Glycolysis, citric acid cycle & its significance,
- HMP shunt & Gluconeogenesis (in brief),
- regulation of blood glucose level. EM pathway

2. Amino acids - Definition, classification, essential & non essential amino acids. physical /chemical/biological properties of amino acid

3. Chemistry of Proteins & their related metabolism -

- Introduction,
- definition, classification, digestion and absorption, structure properties of protein
- qualitative test of protein biomedical importance.
- Metabolism : amino acid pool and nitrogen balance
- Catabolism : Transamination,
- Deamination,
- Urea cycle,

4. Chemistry of Lipids & their related metabolism -

- Introduction,
- definition, classification,
- biomedical importance,
- **Fat** structure, character, physical and chemical properties
- **Fatty acids**.-definition and classification
- Metabolism :
- Beta oxidation of fatty acids,
- fatty liver, fatty acid synthesis cholesterol synthesis
- Ketone bodies and ketogenesis, disease related to lipid metabolism
- Wax- properties and function
- Phospholipids- biological function and classification
- Glycolipids and lipoprotein.
- Alcohol(glycerol)-physical/chemical properties.



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- Steroids-definition/classification
 - Cholesterol-structure and colour reaction
 - Qualitative test for lipids.
- 5- Nucleic acid-** structure of RNA / DNA
- 6- Enzymes -**
- Introduction, definition, classification,
 - Medical significance of enzyme, diagnostic application of enzyme
 - factors affecting enzyme action,
 - enzyme inhibition,
- 7- Nutrition**
- Definition and role
 - Nutritional aspect and importance of carbohydrate, protein and fat
 - Calories and BMR
 - SDA and balance diet
- 8- Vitamins**
- Definition and classification
 - Biological properties and structure of Fat & Water soluble vitamins
- 9- Assays**
- Radio immune assays (RIA)- Principle Application of RIA in clinical biochem lab
 - ELISA and its types
 - Application of ELISA in clinical biochem lab

PRACTICAL

1. Study of colorimeter, spectrophotometer, flame photometer, electrophoresis instruments, ELISA reader, Gamma Counter (RIA) Demo and instruction.
2. Separation of amino acid by TLC (Thin Layer chromatography), separation of plasma protein by electrophoresis.
3. Identification of carbohydrate by molisch test, barfoed's test, benadict test by iodine selliwonoff's
4. Identification of protein by biurete test, xanthoproteic, millions test, aldehyde test, Ninhydrin test, lead acetate.
5. Identification of fat by solubility test, translucency test, unsaturation test, saponification test, by formation of temporary emulsion and permanent emulsion.

HAEMATOLOGY



Subject Code : BMLT-202

37.

THEORY SYLLABUS

UNIT 1 blood bank and blood group system

- Blood bank – introduction instrumentation and equipment
- Blood group system – history ,discovery, classification ,ABO ,Bombay, Rh
- ABO and RH typing determination

UNIT 2 Blood transfusions

- Antiglobulin techniques (Coombs test)
- Application of AHG test,
- Compatibility test in blood transfusion
- Blood transfusion reaction complication and hazards
- Lab schedule for mismatched transfusion
- Selection of donor and collection of blood sample in blood bank
- Preparation of packed cell, various fraction of blood for transfusion.

UNIT 3 -Bone marrow Study

- Bone marrow types clinical significance and collection of sample (bone marrow biopsy)
- Smear preparation and staining of bone marrow
- Preparation of bone marrow section for histological study
- MGG stain for Bone Marrow Study

UNIT 4- Study of Hemoglobin

- Hemoglobin – Structure ,function ,Biosynthesis And Degradation
- Hb pigments and their measurements
- Abnormal Hb and their means of identification and estimation
- L.E. cell phenomenon, demonstration of L.E. factor

UNIT 5-Blood Coagulation

- Haemostatic mechanism (extra vascular effect, vascular effect and intra vascular effect)
- Function of platelets in homeostasis
- Blood coagulation and coagulation factor
- Mechanism of blood coagulation (intrinsic & extrinsic pathways)
- Fibrinolysis
- Bleeding disorder and lab investigation BT,CT
- PT,PTT,APTT –principles and techniques
- Clinical approach to bleeding disorder.
- Physicochemical properties of coagulation facto

PRACTICAL –

- Qualitative test for ABO grouping with antisera (by Slide & Tube method)
- Qualitative test for RH typing (by Slide & Tube method)



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- Bone marrow smear and stained
- Measurement of bile pigment, urobilinogen
- LE cell and various method practical
- Bleeding time and clotting time
- Estimation of PT, APTT, PTT, LT,
- Coombs Test practical
- Cross matching –practical
- Study of blood transfusion reaction
- Separation of blood components
- Determination of G6PD test
- Determination of hemosidrin in urine practical

HISTOLOGY Subject Code: BMLT-203

38.

THEORY SYLLABUS

UNIT 1 Study of various body tissues

- Histology and histological method
- Cell structure and cell organelles
- Epithelial tissue
- Connective tissue including bone and cartilage
- Muscular tissue
- Nervous tissue
- Endocrine tissue and glands

UNIT 2 histological study of various system of the body

- The circulatory system
- The alimentary system
- Digestive system including liver, pancreas and gall bladder
- The respiratory system
- The urinary system



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- The system of endocrine glands
- The reproductive system
- Nerves endings and organs of special senses

UNIT 3 – Microscopy, working principle, maintenance and application of various types of-

- Dark ground microscope
- Polarizing microscope
- Phase contrast microscope
- Interference microscope
- UV light microscope
- Micrometry

UNIT 4 – Special staining method of histological section

- Chemistry of color in dyestuffs and classification of dyes
- Metachromasis and metachromatic dye
- Hematoxylin stain its importance and preparation
- Carbohydrate and amyloid-special stain and procedure
- PAS Stain (periodic acid Schiff reaction for carbohydrate)
- Staining method for mucins
- Acid polysaccharide and mucoprotein staining method
- Silver impregnation method for reticulin
- Weir iron hematoxylin and van Gieson staining for collagen.
- Martin's scarlet blue stain for collagen and fibrin
- Elastic fibers-Gomori's aldehyde-fuchsin method
- Principle of metal impregnation technique
- Endogenous pigments hemoglobin hemosiderin staining
- Bile pigments/melanin and lipofuscin
- Exogenous pigments stains

UNIT 5 Cytology

- Stain cytological preparation with special emphasis of MGG stain
- Papanicolaou stain
- Special stain- PAS, mucoprotein, Alcian blue method
- Alkaline and acid phosphatase-indoxyl method
- Cytological screening and quality control in cytology laboratory



PRACTICAL

- Staining of tissue section by using H & E method.
- Demonstration of component in smear of exfoliated cell by PAP method.
- Histological study of slide-animal cell, mammal spinal cord, nerve cell, nonstriated muscle, striated muscles, cardiac muscles, hyaline cartilage, connective tissue, mammal pancreas, mammal kidney, stomach, liver, ovary, testis, artery, lungs, bone, small intestine, yellow elastic cartilage, gall bladder, edenohypophysis, mucous gland fallopian tube, salivary gland, ureter, thyroid gland, suprarenal colon, skin esophagus, trachea.

MICROBIOLOGY

Subject Code: BMLT-204

39.

THEORY SYLLABUS

Bacteriology

- Biochemical test for identification of bacteria, classification morphology, characteristics, biochemical reaction, clinical disease, toxins and lab diagnosis of – micrococci, staphylococci, streptococci, pneumococci, coryne-bacteria, Escherichia, klebsiella, enterobacter, proteus-providencia salmonella, shigella, Arizona, citrobacter, yersinia, pseudomonas, vibrio, haemophilus, mycobacterium, brucella, bordetella, bacillus, clostridia anaerobic cocci, neisseria, treponema, borrelia, leptospira, mycoplasma, rickettsia, Chlamydia, trich agents.
- Pathogenic and non pathogenic fungi
- Candida, cryptococci, Dermatophytes, sporotrichomonas, histoplasma, blastomyces, coccidioides, paracoccidioides, dematiaceous fungi, mycetoma, actinomyces, nocardia and common laboratory contaminants.
- Biochemical test used for identification of bacteria fungi.
- Antimicrobial sensitivity testing and assay method for body fluids
- Antimicrobial susceptibility testing for mycobacteria
- Preparation and standardisation of antigen and antisera

VIROLOGY

Different staining technique used in virology



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Uses of embryonated egg inoculation in clinical virology
Principles of animal cell culture and their uses in virology
Use of common laboratory animals in viral diagnosis

PRACTICAL

1-Demonstration of staining procedures: preparation of the following stains and demonstration of viral inclusion bodies:

- Seller's stain for negri body demonstration.
- Giemsa stain for CMV and herpes viral inclusions.

2-preparation of reagents for serological tests: phosphate buffered saline, veronal buffered saline, alsever's solution, dextrose gelatin, veronal buffer and tris buffer.

3-principles and performance of viral haemagglutination and haemagglutination inhibition test.

4-demonstration of haemadsorption test, (misprint)

5-collection, titration and preservation of guinea pig (misprint).

6- Demonstration of complement fixation test.

7- Demonstration of immunofluorescence test and misprint test.

8- Demonstration of ELISA for antigen antibody test.

SCHEME FOR THIRD YEAR

		Internal Assessment		University Examination			
Code	Title of Papers	Theory	Practical	Theory	Viva	Practical	Total
BMLT-301T	Clinical Biochemistry	50	50	100	50	50	300
BMLT-302T	Special Histology	50	50	100	50	50	300
BMLT-303T	Applied Haematology	50	50	100	50	50	300
BMLT-304T	Applied Microbiology	50	50	100	50	50	300
TOTAL							1200

Note



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Passing marks in All subject candidate must obtain 50% in aggregate with minimum of 50% in Theory, Including viva and minimum 50% in practical.

BMLT THIRD YEAR BIOCHEMISTRY SUBJECT CODE -301

THEORY SYLLABUS

1. Principles of assay procedure for biological material (serum/plasma/urine/other body fluid).
2. Principle, clinical condition & requirement with sample collection, estimation, interpretation and source of error of total protein albumin, glucose, urea, uric acid, creatinine, cholesterol, bilirubin, sodium and potassium, chloride, calcium, PPD, 17 ketogenic steroid and barbiturate.
3. Glucose tolerance test, insulin tolerance test, gastric analysis, xylose absorption test, clearance test for renal function.
4. Enzymes – acid and alkaline phosphates, AST(SGOT), ALT(SGPT), amylase, lactate dehydrogenase, CPK.
5. Analysis of calculi and CSF-formation, factor responsible, chemical examination and reagent preparations.
6. Quality control of clinical investigation, computer application in clinical biochemistry lab, computerization of clinical lab instrument, auto analyzer, clinical cornea, auto pacer, ELISA, RIA
7. Laboratory organization management- maintenance of records, stock room and register, lab safety-accident and first aid, biological hazards and bio safety labels, disposal bio hazards sample.

PRACTICAL



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- Estimation of blood glucose
- Estimation of total protein and albumin
- Estimation of blood urea
- Estimation of serum creatinine
- Estimation of serum bilirubin
- Estimation of sodium and potassium
- Estimation of GTT (glucose tolerance test)
- Estimation of alkaline phosphatase
- Estimation of SGOT and SGPT
- Estimation of uric acid
- Estimation of acid phosphatase
- Estimation of serum total cholesterol
- Estimation of serum triglycerides
- Estimation of CPK

SPECIAL HISTOLOGY

SUBJECT CODE 302

THEORY SYLLABUS

Special histology and histochemical method.

- Handling of fresh histological specimen (tissue), cryo/frozen section of fresh and fixed tissue freeze drying
- Lipid-identification and demonstration.
- Micro-organism in the tissue various staining, technique for their demonstration and identification.
- Nucleic acid, DNA and RNA special stains and procedure.
- Cytoplasm constituents and their demonstration.
- Tissue requiring special treatment i.e. eye ball, B.M biopsy, under calcified bones
- Neuropathology technique
- Enzyme histochemistry demonstration of phosphate, dehydrogenases, oxidizes and peroxidizes etc.



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- Electron microscope, working principle, component and allied technique for electron microscopy, ultramicrotomy.
- Museum technique

Cytology

- Cervical cytology basic of detection of malignant and premalignant lesions.
- Hormonal assessment with cytologic technique and sex chromatin and pregnancy test\
- Aspiration cytology principles, indication and utility of techniques with special emphasis on role of cytotechnician in FNAC clinics

Immunopathology

- Cells and organ of immune system
- Immunoglobulin's, antioxidants and humeral immune response.
- Allergy
- Rheumatological disease and investigation
- Infection and immune system
- Cancer immunology
- Tissue typing for kidney transplant.

PRACTICAL

- Study of electron microscope
- Gram stain on paraffin section
- AFB(ZN)stain on paraffin section
- PAP smear staining
- FNAC (HE and papanicolaus)staining
- Eyeball processing
- PAS stain
- Mounting technique
- Shorr's staining method
- Silver impregnation method
- Trichrome method
- Weigerts iron haemotoxylin and van gieson stain



APPLIED HAEMATOLOGY SUBJECT CODE –BMLT 303

THEORY SYLLABUS

- Definition and classification of anemia
- Laboratory investigation of megaloblastic anemia.
- Laboratory investigation of iron deficiency anemia.
- Laboratory investigation for hemolytic anemia including classification and cause.
- Leukemia : definition and classification
- Cytochemical staining procedures in various hematopoietic disorders.
- Laboratory test for assessing bleeding disorders.
- Laboratory investigation for disseminated intravascular coagulation (DIC).
- Mechanism of Fibrinolysis: test for Fibrinolysis.
- Platelet function test and their interpretation.
- Technique available for cytogenetic studies.
- Use of radioisotopes in hematology
- Safety measure for handling radio isotopes.

PRACTICAL

1. Demonstration of megaloblastic anemia
2. Investigation iron deficiency anemia (Hb%, R.B.C, PCV, red cell indices, bone marrow staining)
3. Demonstration of hemolytic anemia (reticulocyte count, sickling test, coomb's test)
4. Demonstration of assessing blood disorder (P.T.A, APTT)
5. Demonstration of P.Smear of acute leukemia (CML, AML, ALL, multiple myeloma)
6. Demonstration of osmotic fragility of red blood cells
7. Demonstration of fetal hemoglobin
8. Preparation of Heinz bodies.
9. G6PD estimation



APPLIED MICROBIOLOGY SUBJECT CODE –BMLT 304

THEORY SYLLABUS

- 1- Preservation of microbes and lyophilisation methods. Total and viable count of bacteria.
- 2- Testing of disinfectants-Rideal-Walker, Chick-Martin and In-use tests.
- 3- Preparation and standardization of vaccines and immunization schedule.
- 4- Bacteriological examination of water, milk, food and air.
- 5- Nosocomial, infections and sterility testing of I.V. fluids and processing of various samples for hospital infections.
- 6-Toxin-Antitoxin assays pathogenicity tests.
- 7-Epidemiological markers of micro-organisms serotyping .Bacteriophage and Bactriocine typing methods.
- 8- Lab. Diagnosis of common bacterial infections viz.pyogenic infections,Respiratory tract infections, meningitis, Diptheria, whooping cough , gas gangrene ,food poisoning, enteric fever, acute diarrhea, cholera, urinary tract infection, tuberculosis, leprosy, plague, anthrax, typhus fever, syphilis , Gonorrhoea and other STD's.
- 9-Serological test: widal, ASO, LET, CRP, rosewaller, brucella agglutination, cold agglutination , VDRL, TPHA, FTA-ABS.
- 10-Lab. Diagnosis of fungal infections, candidiasis , crytococosis, pulmonary infections, Mycetoma, other deep mycotic infections, subcutaneous fungal infections-sporotrichosis, chromoblastomycosis, eye and ear fungi infections.
- 11- Serological tests for fungal infections and skin test.
- 12-Advanced technique in microbiology-ELISA, RIA, CCIEP, Co-agglutination GLC, HPLC, etc.
- 13-Rapid diagnostic methods and automation in microbiology.

Virology

- Principles of serological techniques used in Virology Part 1:HA HAI,HAD, SRH, RPHA, IHA, CFT, CIEP.
- Principles of serological techniques used in Virology Part 2: Nt , ELISA,RHA, IF , Immuno-peroxides test.



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- Mode of transmission of viral agents.
- Prevention of viral diseases.
- Immunity in viral infections.

Parasitology

- Morphology and life cycle of balantidia, toxoplasm
- Diagnosis of morphology and life cycle of trematodes –intestine, blood fluorescence, lung fluorescence.

PRACTICALS

1. Bacteriological examination of milk(methylene blue test)
2. Bacteriological examination of milk(phosphate test)
3. Bacteriological examination of milk(turbidity test)
4. Bacteriological examination of food
5. Bacteriological examination of water(MPN method)
6. Bacteriological examination of air(settle plate method)
7. Serological test widal, V.D.R.L, ASO,CRP,CFT
8. Mycological examination eye & ear infection
9. Study of immunological technique for viral identification by ELISA & RIA
10. Identification of causative agents in given sample
11. A.F.B Staining