

SYLLABUS FOR FIRST YEAR BSC IN MEDICAL LABABORATORY TECHNOLOGY COURSES – SCHEME OF EXAMINATION

S.NO	SUBJECT	DISTRIBUTION OF MARKS				
		TH	Int.	PRACTICAL		TOTAL
				THEORY	Intrnal	
1	ANATOMY	80	20			100
2	PHYSIOLOGY	80	20			100
3	BIOCHEMISTRY	80	20	40	10	150
4	PATHOLOGY	80	20	40	10	150
5	MICROBIOLOGY	80	20	40	10	150
6	ENGLISH	80	20			100
7	BIO STATISTICS	80	20			100
8	HEALTH CARE	80	20			100
9	ENVIRONMENT SCIENCE	80	20			100
10	BASIC IN COMPUTER APPLICATION	80	20			100
	TOTAL					1150

SYLLABUS FOR SECOND YEAR BSC. IN MEDICAL LABABORATORY TECHNOLOGY COURSES – SCHEME OF EXAMINATION

S.NO	SUBJECT	DISTRIBUTION OF MARKS				
		TH	Int.	PRACTICAL		TOTAL
				THEORY	Intrnal	
1	BIOCHEMISTRY	80	20	40	10	150
2	MICROBIOLOGY	80	20	40	10	150
3	PATHOLOGY	80	20	40	10	150
4	TOTAL	240	60	120	30	450

SYLLABUS FOR THIRD YEAR BSC IN MEDICAL LABABORATORY TECHNOLOGY COURSES – SCHEME OF EXAMINATION

S.NO	SUBJECT	DISTRIBUTION OF MARKS				
		TH	Int.	PRACTICAL		TOTAL
				THEORY	Intrnal	
1	BIOCHEMISTRY	80	20	40	10	150
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3	PATHOLOGY	80	20	40	10	150
	TOTAL	240	60	120	30	450

SYLLABUS FOR DEGREE IN MEDICAL LABABORATORY TECHNOLOGY COURSES

FIRST YEAR

1. ANATOMY
2. PHYSIOLOGY
3. BIOCHEMISTRY
4. PATHOLOGY
5. MICROBIOLOGY
6. ENGLISH
7. BIO STATISTICS
8. HEALTH CARE
9. ENVIRONMENT SCIENCE
10. BASIC IN COMPUTER APPLICATION

SECOND YEAR

1. BIOCHEMISTRY
2. PATHOLOGY
3. MICROBIOLOGY

THIRD YEAR

1. BIOCHEMISTRY
2. PATHOLOGY
3. MICROBIOLOGY

SYLLABUS FOR FIRST YEAR DEGREE IN MEDICAL LABORATORY TECHNOLOGY COURSES -

B. Sc Medical Laboratory Technology

ANATOMY

No of theory classes: 70 hours

No. of practical classes : 20 hours

1. Introduction human body as a whole

Theory: Definition of anatomy and its divisions, terms of location, positions and planes. Cell and its organelles epithelium-definition, classification, describe with examples, function. Glands- classification, describe serous & mucous glands with examples Basic tissues - classification with examples

Practical: Histology of types of epithelium, histology of serous, mucous & mixed salivary gland

2. Locomotion and support

Theory Cartilage -- types with example & histology Bone - Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of fetal skull Joints - Classification of joints with examples, synovial joint (In detail for radiology) Muscular system: Classification of muscular tissue & histology, names of muscles of the body

Practical: Histology of the 3 types of cartilage

Demo of all bones showing parts, radiographs of normal bones & joints Histology of compact bone (ITS & LS) Demonstration of all muscles of the body Histology of skeletal (ITS & LS). smooth & cardiac muscle

3 Cardiovascular system

Theory: Heart-size, location, chambers, exterior & interior' Blood supply of heart Systemic & pulmonary circulation Branches of aorta, common carotid artery. subclavian artery, axillary artery, brachial artery. superficial palmar arch, femoral artery, internal iliac artery Peripheral pulse Inferior venacava, portal vein, portosystemic anastomosis Great saphenous vein Dural venous sinuses Lymphatic system- cisterna chyli & thoracic duct Histology of lymphatic tissues Names of regional lymphatics, axillary and inguinal lymph nodes in brief

Practical

Demonstration of heart and vessels in the body

Histology of large artery. medium sized artery & vein,

large vein Microscopic appearance of large artery, medium sized artery & vein, large vein pericardium

Histology of lymph node, spleen, tonsil & thymus

Normal chest radiograph showing heart shadows

Normal angiograms

4 Gastrointestinal system

Theory

Parts of G1T, Oral cavity (lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring) Oesophagus, stomach. small and large intestine, liver. gall bladder, pancreas
Radiographs of abdomen

5. Respiratory system

Theory

Parts of RS nose, nasal cavity, larynx. trachea, lungs, bronchopulmonary segments Histology of trachea, lung and pleura Names of paranasal air sinuses

Practical: Demonstration of parts of respiratory system. Normal radiographs of chest Histology of lung and trachea

6 Peritoneum Theory: Description in brief Practical: Demonstration of reflections

7. Urinary system Theory Kidney, ureter, urinary bladder, male and female urethra Histology of kidney, ureter and urinary bladder

Practical: demonstration of parts of urinary system Histology of kidney, ureter, urinary bladder
Radiographs of abdomen-IVP, retrograde cystogram

8. Reproductive system

Theory: Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology) Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)
Mammary gland — gross

Practical: demonstration of section of male and female pelvis with organs in situ Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary Radiographs of pelvis — hysterosalpingogram

9 Endocrine glands

Theory: Names of all endocrine glands in detail on pituitary gland. thyroid gland, parathyroid gland suprarenal gland — (gross & histology)

Practical: Demonstration of the glands Histology of pituitary, thyroid, parathyroid, suprarenal glands

10 Nervous system

Theory: Neuron Classification of NS, Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology) Meninges, Ventricles & cerebrospinal fluid Names of basal Blood supply of brain Cranial nerves Sympathetic trunk & names of parasympathetic ganglia

Practical. Histology of peripheral nerve & optic nerve
Demonstration of all plexuses and nerves in the body
Demonstration of all part of brain
Histology of cerebrum, cerebellum, spinal cord

11 Sensory organs

Theory:

Skin: Skin-histology Appendages of skin Eye: Parts of eye & lacrimal apparatus Extra-ocular muscles & nerve supply Ear. parts of ear- external middle and inner ear and contents

Practical Histology of thin and thick skin Demonstration and histology of eyeball Histology of cornea & retina

12. Embryology:

Theory: Spermatogenesis & oogenesis Ovulation, fertilization Fetal circulation Placenta

REFERENCE BOOKS Anatomy

- 1 William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill
2. Chaurasia -A Text book of Anatomy IS. Ranganathan - A text book of Human Anatomy
3. Fattana, Human anatomy (Description and applied) Saunders & C P Prism Publishers. Bangalore - 1991
- 4 ESTER . M. Gnshcimer, Physiology & Anatomy with Practical Considerations J P Lippin Cott Philadelphia

SYLLABUS FOR FIRST YEAR MEDICAL LABORATORY TECHNOLOGY COURSES –

B.Sc Medical Laboratory Technology

PHYSIOLOGY

Theory 70 hours

Practical 20hours

1. Introduction - composition and function of blood

Red blood cells - Erythropoiesis stages of differentiation function • count physiological variation. Haemoglobin - Structure. functions, concentration physiological variation Methods of Esbmabon of Hb White blood cells - Production, function, life span, count, differential count Platelets - Onigin, normal count, morphology functions. Plasma Proteins - Production, concentration, types, albumin, globulin, Fibrinogen,prothrombin functions. Haernostasis & Blood coagulation • Haemostasis - Definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors • • Blood Bank Blood groups - ABO system, Rh system, Blood grouping & typing, Cross matching, Rh system - Rh factor, Rh in compatibility Blood transfusion - Indication, universal donor and recipient concept, selection criteria of a blood donor, transfusion reactions Anticoagulants - Classification, examples and uses

2. Anaemias Classification - morphological and efilogical. effects of anemia on body Blood indices - Colour index , MCH, MCV, MCHC. Erythrocyte sedimentation Rate (ESR) and Paced cell volume

Normal values, Definition determination. Blood Volume -Normal value ,determination of blood volume and regulation of blood volume Body fluid - pH. normal value, regulation and variation Lymph - lymphoid tissue formation. circulation, composition and function of lymph.

3. Cardiovascular system Heart - Physiological Anatomy, Nerve supply, properties of Cardiac muscle, Cardiac cycle - systole. diastole. Intraventricular pressure curves. Cardiac Output - only definition, Heart sounds Normal heart sounds Areas of auscultation. Blood Pressure - Definition, normal value, clinical measurement of blood pressure. Physiological variations. regulation of heart rate, cardiac shock, hypotens hypertension. Pulse - Jugular, radial pulse, Triple response Heart sounds - Normal heart sounds, cause characteristics and significance. Heart rate Electrocardiogram (ECG) - Significance

4. Digestive System - Physiological anatomy of Gastro intestinal tract, Functions of digestive system, Salivary glands. Structure and functions Deglutination - Stages and regulation Stomach - structure and functions Gastric secretion - Composition function regulation of gastric juice secretion Pancrease - structure, function, composition, regulation of pancreatic juice Liver - functions of liver, bile secretion, composition, function regulation of bile secretion Bilirubin metabolism, types of bilirubin, Vandernberg reaction, Jaundice- types and significance. Gall bladder - functions Intestine - small intestine and large intestine Small intestine -Functions- Digestive, absorption ,movements Large intestine - Functions, Digestion and absorption of Carbohydrates, Proteins. Fats, Lipids, Defecation

5. Respiratory System Functions of Respiratory system, Physiological Anatomy of Respiratory system, respiratory tract, respiratory muscles, Respiratory organ-lungs. Alveoli, Respiratory. membrane, stages of respiration Mechanism of normal and rigorous respiration. Forces opposing and favouring expansion of the lungs. Infra pulmonary pleural pressure, surface tension, recoil tendency of the wall

Transportation of Respiratory gases: Transportation of Oxygen. Direction, pressure gradient, Forms of transportation, oxygenation of Hb. Quantity of Oxygen transported. Lung volumes and capacities. Regulation of respiration what? Why? How? Mechanisms of Regulation. nervous and chemical regulation. Respiratory centre, Hearing Brier Reflexes Applied Physiology and Respiration Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea. ,

6. Endocrine System - Definition Classification of Endocrine glands & their Hormones Properties of Hormones Thyroid gland hormone - Physiological, Anatomy, Hormone secreted, Physiological function, regulation of secretion Disorders - hypo and hyper secretion of hormone. Adrenal gland Adrenal cortex physiologic anatomy of adrenal gland. Adrenal cortex, cortical hormones - functions and regulation. Adrenal medulla - Hormones, regulation and secretion. Functions of Adrenaline & noradrenaline Pituitary hormones - Anterior and posterior pituitary hormones, secretion. function. Pancreas - Hormones of pancreas Insulin - secretion, regulation, function and action Diabetes mellitus - Regulation of blood glucose level Parathyroid gland - function, action ,regulation of secretion of parathyroid hormone. Calcitonin - function and action

7. Special senses Vision - structure of eye Function of different parts Structure of retina Hearing structure and function of ear mechanism of hearing Taste - Taste buds functions Smell physiology, Receptors

8. Nervous System Functions of Nervous system, Neurone structure, classification and properties. Neuroglia, nerve fiber, classification ,conduction of impulses continuous and salutatory .Velocity of impulse transmission and factors affecting. Synapse — structure, types,properties. Receptors— Definition, classification, properties. Reflex action — unconditioned properties of reflex action. Babinski's sign. Spinal cord nerve tracts, Ascending tracts, Descending tracts — Pyramidal tracts —

Extrapyramidal tracts. Functions of Medulla, pons, Hypothalamic, disorders. Cerebral cortex lobes and functions. Sensory cortex, Motor cortex, Cerebellum functions of Cerebellum Basal ganglion-functions. EEG.

Cerebral Spinal Fluid (CSF) formation. circulation, properties, composition and functions, lumbar puncture Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions.

9. Excretory System Excretory organs Kidneys Functions of kidneys structural and functional unit nephron, vasculature, cortical and juxtamedullary nephrons — Comparison, Juxta Glomerular Apparatus — Structure and function. Renal circulation peculiarities. Mechanism of Urine formation: Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR Determination of GFR selective reabsorption — sites of reabsorption .substance reabsorbed, mechanisms of reabsorption Glucose, urea H + Cl aminoacids etc. TMG, Tubular load. Renal threshold % of reabsorption of different substances, selective secretion. Properties and composition of normal urine. urine output. Abnormal constituents in urine, Mechanism of urine concentration. Counter — Current Mechanisms : Micturition. Innervation of Bladder. Cystourethrogram. Diuretics = Water, Diuretics. osmotic diuretics. Artificial kidney Renal function tests — plasma clearance Actions of Aldosterone and PTH on kidneys. Renal function tests

10. Reproductive system Function of Reproductive system, Puberty, male reproductive system. Functions of testes. spermatogenesis site, stages, factors influencing semen. Endocrine functions of testes Androgens— Testosterone structure and functions. Female reproductive system, Ovulation, menstrual cycle. Physiological changes during pregnancy, pregnancy test. Lactation Composition of milk factors controlling lactation. . . 11. Muscle nerve physiology Classification of muscle, structure of skeletal muscle, Sarcomere contractile proteins. Neuromuscular junction. Transmission across, Neuromuscular junction. Excitation contraction, coupling Mechanism of muscle contraction muscle tone, fatigue Rigor

12. Skin -structure and function Body temperature measurement, Physiological variation, Regulation of body Temperature by physical chemical and nervous mechanisms. Role of Hypothalamus, Hypothermia and fever.

Practical's

Haemoglobinometry
White Blood Cell count
Red Blood Cell count
Determination of Blood Groups
Leishman's staining and Differential WBC count
Determination of packed cell Volume
Erythrocyte sedimentation rate (ESR)
Calculation of Blood indices
Determination of Clotting Time,
Bleeding Time Blood pressure Recording
Auscultation for Heart Sounds
Artificial Respiration
Determination of vital capacity

NO PRACTICAL EXAMINATION

REFERENCE BOOKS Physiology

- 1 Guyton (Arthur) Text Book of Physiology Latest Ed. Prism publishers
2. Chatterjee(CC) Human Physiology Latest Ed. Vol-1, Medical Allied Agency
- 3 Choudhan (Su)ith K) Concise Medical Physiology Latest Ed New Central Book,
- 4 Ganong (William F) Review of Medical Physiology. Latest Ed Appleton

SYLLABUS FOR FIRST YEAR MEDICAL LABORATORY TECHNOLOGY COURSES –

B.Sc. Medical Laboratory Technology BIOCHEMISTRY

No Theory classes 70 hours

No of practical classes 20 hours

Theory

1. Specimen collection Pre-analytical variables, Collection of blood, Collection of CSF & other fluids, Urine collection

Use of preservatives Anbcoagulants

Introduction to Laboratory apparatus

Pipettes- different types (Graduated, volumetric, Pasteur, Automatic etc) Calibration of glass pipettes Burettes, Beakers. Petri dishes. depression plates Flasks - different types)Volumetric, round bottmed. Erlenmeyer c,ritcal etc I

Funnels - different types (Conical, Buchner etc..) Bottles - Reagent bottles - graduated and common. Wash bottles - different type Specimen bottles etc.. Measuring cylinders, Porcelain doh Tubes - Test tubes. centrifuge tubes, test tube braining rack, tripod stand, Wire gauze, Bunsen ouner. Cuvettes, significance of cuvettes in colorimeter, cuvettes for visible and UV ranee. cuvette holders Racks - Bottle, Test tube, Pipette Dessicator, Stop watch, rimers, scissors Dispensers - reagent and sample Any other apparatus which is important and may have been missed should also be covered Maintenance of lab glass ware and apparatus: Glass and plastic ware in Laboratory use of glass: significance of boro silicate glass and cleaning of glass ware, different cleaning solutions of glass • care and cleaning of plastic ware, different clean,,g solutions

2 Instruments (Theory and demonstration) Diagrams to be drawn Water bath: Use. care and maintenance, Oven & Incubators Use, care and maintenance. Water Dotilation plant and water deionisers. Use. care and maintenance Refrigerators, cold box, deep freezers - Use care and maintenance Reflux condenser . Use, care and maintenance Centrifuges (Theory and demonstration) Diagrams to be drawn Definition, Principle, svedberg unit, centrifugal force, centrifugal field rpm. ref. Conversion of G to rpm and vice versa. Different types of centrifuges Use care and maintenance of a centrifuge Laboratory balances (Theory & Practice's) Diagrams to be drawn Manual balances. Single pan, double pan, trip balance Direct read out electrical balances Use care and maintenance. Guideline to be followed and precautions to be taken while weighing. Weighing different types of chemicals, liquids. Hygroscopic compounds etc. Colorimeter and spectrophotometer (Theory and Practicalsi Diagrams to be drawn Principle. Parts Diagram Use, care and maintenance_ pH meter (Theory & practice's) Diagrams to be drawn principle, parts, Types of electrods, salt bridge solution Use, care and maintenance of Ph meter and electrodes Guidelines to be followed and precautions to be taken while using pH meter

3 Safety of measurements

4 Conventional and SI units

5 Atomic structure Dalton's theory, Properties of electrons, protons, neutrons, and nucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbit and orbital. Quantum numbers, Heisenberg's uncertainty principle. Electronic configuration - Aufbau principle Pauli's exclusion principle. etc. Valency and bonds - different types of strong and weak bonds in detail with examples Theory & Practice's for all the following under this section Molecular weight, equivalent weight of elements and compounds. normality molarity Preparation of molar solutions (mole/litre solution) eg: 1 M NaCl, 0.15 M NaCl 1 M NaOH, 0.1 M HCl, 0.1 M H₂SO₄ etc , Preparation of normal solutions. eg.. 1N Na₂CO₃. 0.1N Oxalic acid, 0.1 N HCl. 0.1N H₂SO₄, 0.66 N H₂SO₄ etc., Percent solutions Preparation of different solutions - v/v w/v (solids, liquids and acids) Conversion of a percent solution into a molar solution.

Dilutions

Diluting solutions: eg. Preparation of 0.1 N NaCl from 1 N NaCl from 2 N HCl etc., Preparing working standard from stock standard, Body fluid dilutions, Reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc..

Saturated and supersaturated solutions. Standard solutions. Technique for preparation of standard solutions eg. Glucose, urea, etc., Significance of volumetric flask in preparing standard solutions.

Volumetric flasks of different sizes, Preparation of standard solutions of deliquescent compounds (CaCl₂, potassium carbonate, sodium hydroxide etc-) Preparation of standards using conventional and SI units

Acids, bases, salts and indicators.

Acids and Bases' Definition, physical and chemical properties with examples. Arrhenius concept of acids and bases. Lowry - Bronsted theory of acids and bases classification of acids and bases.

Difference between bases and alkali, acidity and basicity, monoprotic and polyprotic acids and bases Concepts of acid base reaction, hydrogen ion concentration. Ionisation of water, buffer, pH value of a solution. preparation of buffer solutions using pH meter.

Salts. Definition, classification, water of crystallization - definition and different types. deliquescent and hygroscopic salts

Acid- base indicators: (Theory and Practical)

Theory - Definition, concept, mechanism of dissociation of an indicator, colour change of an indicator in acidic and basic conditions. use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range, suitable pH indicators used in different titrations, universal indicators Practical - Titration of a simple acid and a base (Preparation of standard solution of oxalic acid and using this solution finding out the normality of a sodium hydroxide solution Acid to be titrated using this base) Calculation of normality of an acid or a base after titration, measurement of hydrogen ion concentration

Quality control • Accuracy Precision Specificity Sensitivity Limits of error allowable in laboratory Percentage error Normal values and Interpretations

Special Investigations: Serum Electrophoresis

Immunoglobulins

Drugs. Digitoxin, Theophylline's Regulation of Acid Base status. Henderson Hasselback Equations Buffers of the fluid pH Regulation Disturbance in acid Base Balance Anion Gap Metabolic acidosis Metabolic acidosis Metabolic alkalosis Respiratory acidosis Respiratory alkalosis.

Basic Principles and estimation of Blood Gases and pH Basic principles and estimation of Electrolytes Water Balance Sodium, regulation Bicarbonate buffers, Nutrition, Nutritional support with special emphasis on parental nutrition. Calorific Value , Nitrogen Balance Respiratory Quotient ,Basal metabolic rate, Dietary Fibres Nutritional importance of lipids, carbohydrates and proteins Vitamins.

PRACTICALS

1. Analysis of Normal Urine Composition of urine Procedure for routine screening Urinary screening for inborn errors of metabolism Common renal disease Urinary calculus Urine examination for detection of abnormal constituents

2. Interpretation and Diagnosis through charts Liver Function tests Lipid Profile Renal Function test

3 Cardiac markers Blood gas and Electrolytes 4 Estimation of Blood sugar. Blood Urea and electrolytes 5. Demonstration of Strips Demonstration of Glucometer.

Internal Assessment Theory - Average of two exams conducted 20 Practice's- Record & Lab work' 10

- • There shall be no University Practical Examination and internal assessment marks secured In

REFERENCE BOOKS Biochemistry

1 Varley - Clinical chemistry

2 TEITZ - Clinical chemistry

3 Kaplan - Clinical chemistry

4 Ramakrishna(S) Prasanna(KG), Rajra A Text cook of Medical Biochemistry Latest Ed Orient longman Bombay -1980

5 Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students, Latest Ed

6DAS(Debajyothi) Biochemistry Latest ED Academic, Publishers. Cuic,,ta - 1992

SYLLABUS FOR FIRST YEAR MEDICAL LABORATORY TECHNOLOGY COURSES – B. Sc Medical Laboratory Technology

PATHOLOGY - 1' Year

Histopathology, Clinical Pathology, Haematology and Blood Banking

Theory - 70 hours

Practical - 20 hours

1. Histopathology - Theory - Introduction to Histopathology - Receiving of Specimen in the laboratory - Grossing Techniques - Mounting Techniques - various Mountants - Maintenance of records and filing of the slides - Use & care of Microscope - Various Fixatives, Mode of action, Preparation and Indication. - Bio-Medical waste management - Section Cutting - Tissue processing for routine paraffin sectors - Decalcification of Tissues - Staining of tissues - HUE Staining - Bo-Medical waste management

2. Clinical Pathology - Theory - Introduction to Clinical Pathology - Collection, Transport, Preservation, and Processing of :arous clinical specimens - Urine Examination - Collection and Preservation of urine. Physical, chemical, Microscopic Examination - Examination of body fluids. - Examination of cerebro spinal fluid (CSF) - Examination of semen

3. Haematology -Theory - Introduction to Haematology - Normal constituents of Blood. their structure and function. - Collection of Blood samples - Various Anticoagulants used in Haematology - Various instruments and glassware used in Haematology, Preparation and use of glassware - Laboratory safety guidelines - SI units and conventional units in Hospital Laboratory.

- ESR - Normal Haemostasis Bleeding Time. Clotting Time. Prothrombin Time, Activated Partial Thromboplastin Time

4. Blood Bank Introduction Blood grouping and Rh TYPES , es Cross matching

PRACTICALS - Urine Examination - Physical -Chemical -Microscopic - Blood Grouping Rh typing - Hb Estimation, Packed Cell Volume [PCV]. Erythrocyte Sedimentation rate[ESR] - Bleeding Time, Clotting Time - Histopathology — Section cutting and H RE Staining.[For BSc MLT only

REFERENCE BOOKS

Pathology — 1. Culling Histopathology techniques

2. Bancroft Histopathology techniques

3. Koss — cytology

4 Winifred greg — Diagnostic cytopathology

5 Orell — Cyto Pathology

6 Todd & Sanford Clinical Diagnosis by laboratory method

7. Dade & Lewis — Practical Haematology

8. Rama= Sood, Laboratory Technology (Methods and interpretation) 4eEd. J P. Bros. New Delhi — 1996)

9 Satish Gupta Short text book of Medical Laboratory for technician J P Bros, New Delhi — 1998

10.Sachdev K.N. Clinical Pathology and Bacteriology 8th Ed. J P Bros. New Delhi-1991 li Krishna - Text book of Pathology. Orient Longman PVT .

SYLLABUS FOR FIRST YEAR MEDICAL LABORATORY TECHNOLOGY COURSES –

B. SC Medical Laboratory Technology

Microbiology — Year Objective, - This course introduces , the principles of Microbiology with emphasis applied aspects of Microbiology of infectious diseases particularly in the following areas Principles practice of sterilization methods. Collection and despatch of specimens for routine microbiological investigations Interpretation of commonly done bacteriological and serological investigations. Control of Hospital infections Biomedical waste management Immunization schedule Theory - 70 hours

1. Morphology of bacteria (4 hours) Classification of microorganisms, size, shape and structure of bacteria Use of microscope in the study of bacteria.

2. Growth and nutrition of bacteria (4 hours) Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology

3. Sterilisation and Disinfection (4 hours) Principles and use of equipment of sterilization namely Hot Air oven, Autoclave and serum inspirator Pasteurization. Anti septic and disinfectants Antimicrobial sensitivity test

4. Immunology (6 hours) Immunity Vaccines, Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL. ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg(Technical details to be avoided)

5. Systematic Bacteriology (20 hours) Morphology, cultivation, diseases caused .laboratory diagnosis including specimen collection of the following bacteria(the classification. antigenic structure and pathogenicity are not to be Ought) Staphylococci, Streptococci, Pneumococci. Gonococci. Meningococci, diphtheria, Mycobacteria, Clostridia. Bacillus, Shigella. Salmonella, Esch colt. Klebsiella, Proteus,vibrio cholerae. Pseudomonas & Spirochetes

6. Parasitology (10 hours) Morphology, life cycle, laboratory diagnosis of following parasites E histolytica. Plasmodium. Tape worms. Iritestinal nematodes

7. Mycology (4 hours) Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes ,opportunistic fungi.

8. Virology (10 hours) General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes. Hepatitis, HIV, Rabies and Poliomyelitis.

9. Hospital infection (4 hours) Causative agents, transmission methods. investigation prevention and control Hospital infection
10. Principles and practice Biomedical waste management (4 hours) Practical (20 hours) Compound Microscope. Demonstration and sterilization of equipments — Hot Air oven, Autoclave Bacterial filters. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chocolate agar. Mac conkey medium. U media, Robertson Cooked meat media. Potassium tellurite media with growth. Mac with LF & NLF, NA with staph Antibiotic susceptibility test. Demonstration of common serological tests —Widal, VRDL, ELISA Grams stain, Acid Fast staining, Stool exam for Helminthic ova Visit to hospital for demonstration of Biomedical waste management. Anaerobic culture methods.

REFERENCE BOOKS Microbiology

- 1 Anathanarayana & Panikar Medical Microbiology
- 2 Roberty Cruckshank - Medical Microbiology - The Practice of Medical Microbiology
- 3 Chatterjee - Parasitology - Interpretation to Clinical medicine. 4 Rippon - Medical Mycology 5 Emmons - Medical mycology 6 Basic laboratory methods in Parasitology, 1st Ed. J P Bros, New Delhi - 199 7 Basic laboratory procedures in clinical bacteriology, EC, J P Brothers. New Delhi 8. Medical Parasitology - Ajit Damle

SYLLABUS FOR FIRST YEAR MEDICAL LABORATORY TECHNOLOGY COURSES - B.Sc Medical Laboratory Technology

SUBSIDIARY SUBJECTS

ENGLISH 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 Organisation or effective note taking and logical processes of analysis and synthesis Use of the dictionary. Enlargement of vocabulary, Effective diction

UNIT - II APPLIED GRAMMAR Correct usage The structure of sentences The structure of paragraphs Enlargements of Vocabulary

UNIT - III WRITTEN COMPOSITION: Precise writing and summarising Writing of bibliography Enlargement of Vocabulary

UNIT - IV: READING AND COMPREHENSION: Review of selected materials and express oneself in one's words. Enlargement of Vocabulary.

UNIT - V: THE STUDY OF THE VARIOUS FORMS OF COMPOSITION: Paragraph, Essay, Letter, Summary, Practice, writing

UNIT - VI: VERBAL COMMUNICATION Discussions and summarization, Debates Oral reports, use in teaching

Scheme of Examination Written (Theory): Maximum Marks —80 marks

No Practical or Viva voce examination This is a subsidiary subject, examination to be conducted by respective colleges. Marks required for a pass is 35%

REFERENCE

1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993
2. Wren and Martin - Grammar and Composition. 1989, Chanda & Co. Delhi
3. Letters for all Occasions. A S Myers_ Pub - Harper perennial

4. Spoken English V. Shasikumar and F, V Dhanija. Pub. By, Tata Mcgraw Hill, New Delhi
5. Journalism Made Simple D Wainwright
6. Writers Basic Bookself Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon 8. Penguin Book of Interviews

BIO STATISTICS

Time Allotted' 20 Hours

Course Description-Introduction to basic statistical concepts methods of statistical analysis: and interpretation of data Behavioural Objectives. Understands statistical terms. Possesses knowledge and skill in the use of basic statistical and research methodology.

Unit —I: Introduction Meaning, definition, characteristics of statistics, Importance of the study of statistics. Branches of statistics, Statistics and health science including nursing, Parameters and estimates. Descriptive and ,referential statistics, Variables and their types. Measurement scales

Unit — II :- Tabulation of Data Raw data, the array, frequency distribution, Basic principles of graphical representation. Types of diagrams - histograms, frequency polygons, smooth frequency polygon. commutative frequency curve, ogive, Normal probability curve.

Unit III: Measure of Central Tendency Need for measures of central tendency, Definition and calculator of mean - ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped, Meaning and calculation of mode. Comparison of the mean, and mode. Guidelines for the use of various measures of central tendency.

Unit IV: Measure of Variability Need for measure of dispersion, The range, the average deviation, The variance and standard deviation, Calculation of variance and standard deviation ungrouped and grouped. Properties and uses of variance and SO

Unit -V: Probability and Standard Distributions. Meaning of probability of standard distribution, the Binominal distribution, the normal distribution, Divergence from normality - skewness. kurtosis.

Unit - VI: Sampling Techniques Need for sampling - Criteria for good samples. application of sampling in Community. procedures of sampling and sampling designs errors, sampling variation and tests of significance

Unit - VII: Health Indicator Importance of health Indicator, indicators Of population, morbidity, mortality. health services. Calculation of rates and rations of health.

Recommended Books: B.K. Mahajan & M Gupta (1995) Text Book of Preventive & Social Medicine, 2002, 17th Edition Jaypee Brothers

HEALTH CARE

Teaching Hours: 40

Introduction to Health Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept. National Health Polio, National Health Programmes (Briefly Objectives and scope) Pc•pulation of India and Family welfare programme in India

Introduction to Nursing

What is Nursing ? Nursing principles. Inter-Personnel relationships. Bandaging : Basic turns; Bandaging extremities; Triangular Bandages and their application. Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep. lifting And Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel

chair. Transferring from bed to stretcher. Bed Side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine, observation of sputum, Understand use and care of catheters, enema giving. Methods Of Giving Nourishment: Feeding, Tube feeding, drips, transfusion, care of rubber goods Recording of body temperature, respiration and pulse, simple aseptic technique, sterilization & disinfection. Surgical Dressing: Observation of dressing procedures First Aid: Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.
Scheme of Examination Written (Theory): Maximum Marks: —80 marks.

No Practical or Viva voce examination This is a subsidiary subject, examination to be conducted by respective colleges. Marks required for a pass is 35%

ENVIRONMENT SCIENCE AND HEALTH

Introduction to Environment and Health Sources, health hazards and control of environmental pollution

Water: the concept of safe and wholesome water, the requirements of sanitary sources of water. Understanding the methods of purification of water on small scale and large scale, various biological standards, including WHO guidelines for third world countries, concept and methods for assessing quality of water. Domestic refuse, sullage, human excreta and sewage their effects on environment and health, methods and issues related to their disposal. Awareness of standards of housing and the effect of poor housing on health. Role of arthropods in the causation of diseases, mode of transmission of arthropods borne diseases, methods of control

Recommended Books. 1.Text Book of Environmental Studies for under graduate courses By Erach Bharucha Reprinted in 2006. Orient Longman Private Limited /Universities Press India Pvt Ltd.

BASICS IN COMPUTER APPLICATIONS

The course enables the students to understand the fundamentals of computer and its applications.

Introduction to Data processing : Features of computers, Advantages of using computers. Getting data into / out of computers. Role of computers. What is Data processing? Application areas of computers involved in Data processing. Common activities in processing. Types of Data processing, Characteristics of information. What are Hardware and Software?

Hardware Concepts Architecture of computers, Classification of computers, Concept of damage, types of storage devices. Characteristics of disks, tapes, Terminals, Printers, Network, Applications of networking concept of PC System care, Floppy care, Data care.

Concept of Software. Classification of software System software. Application of software. Operating system. Computer system. Computer virus. Precautions against viruses. Dealing with viruses. Computers in medical electronics

Basic Anatomy of Computers Principles of programming Computer application - principles in scientific research ; work processing, medicine, libraries. museum , education, information system,

SECOND YEAR

SYLLABUS FOR SECOND YEAR MEDICAL LABORATORY TECHNOLOGY COURSES

B.Sc Medical Laboratory Technology

BIOCHEMISTRY — 2nd Year

THEORY

1. Blood chemistry (Its constituents) 2. Urine chemistry (Its constituents) 3. Biomolecules: a. Carbohydrate: Metabolism & disorder of carbohydrate b. Lipids: Metabolism & disorders lipids. 4. Vitamins: sources, functions, deficiency, requirements, 5. Enzymes — Introduction, Activation energy, classification, activity, specificity, kinetics v_{max} , K_m , Michaelis Menten equation 6. Biophysics- surface tension, osmolarity and viscosity. 7. Photometry, spectrometry, turbidometry, flame photometry and atomic, absorption, spectroscopy. 8. MPNB - Urea, Uric Acid, Creatinine of these importance 9. Nutrition 10. Special investigations, demonstration - Serum electrophoresis, immunoglobulins, drug estimation

PRACTICALS

1. Qualitative analysis of carbohydrates, proteins, amino acids.
2. Estimation blood sugar and Blood Urea
3. Quantitative test for urine glucose and GTT.
4. Qualitative screening test for normal and abnormal urine sample.
5. Estimation of non-protein nitrogenous compounds of blood: Blood urea, Creatinine, Creatinine clearance test (CCT)
6. Protein precipitation, dialysis and separation of proteins, electrophoresis of serum, CSF and urine proteins.

SYLLABUS FOR SECOND YEAR MEDICAL LABORATORY TECHNOLOGY COURSES

B.Sc Medical Laboratory Technology

MICROBIOLOGY — 2nd Year

Topics: Parasitology, Mycology and Virology

1. Introduction of Mycology. Terms & Classification.
2. Lab Diagnosis of Fungal Infections 2 Hrs.
3. Mycology 14 Hrs.
 - a Superficial Mycoses, Malsezzia furfur, T.nigra, T.pidera
 - b. Subcutaneous Mycoses
 - i. Mycetoma
 - ii. Rhinosporidium
 - iii. Sporotrichosis
 - c. Dermatophytes
 - d. Systemic Mycoses
 - i. Histoplasmosis
 - ii Blastomycosis
 - iii. Coccidioidosis
 - iv. Paracoccidioidosis
 - e. Opportunistic Fungi

1. Aspergillosis 2. Penicillosis 3. Zygomycosis 4. Pneumocystis 5. Mycotoxins

4. Parasitology

1. Protozoology- Entamoeba histolytica, Balantidium coli, Giardia. Toxoplasma, Malaria. Leishmania
2. Helminthology Cestodes - Taenia, Echinococcus, alatum. H.nana, Trematodes • Schistosoma, Fasciola

Nematodes — Ascaris, hookworm, Strongyloides, Trichuris, Trichinella, Dracunculus, Filarial worms

5 Virology- General properties of virus, cultivation of viruses, Pox viruses, Herpes viruses, Adenoviruses, Picornaviruses, Orthomyxovirus, Paramyxoviruses, Arboviruses, Rhabdoviruses, hepatitis viruses, Oncogenic viruses, HIV, Parvovirus, Viral haemorrhagic fevers, SARS, Rotavirus,, Norwalk virus, Astrovirus, Corona virus

PRACTICALS for II year: Parasitology:

1. Stool examination a Saline mount b. Iodine mount

Mycology: 1. Slide culture technique 2. KOH mount 3. Identification of fungal cultures a. Colony characteristics and Microscopic examination of Candida, Cryptococcus, Trichophyton, Microsporium, Aspergillus niger, Asp fumigatus, Rhizopus, Fusarium,

Virology 1. Demonstration of embryonated egg inoculation 2. Virology exercise: a. Spots test, ELISA (HBV, HCV, HIV), HI, Paul Bunnell test b. Applied exercise — Rabies, Infantile Diarrhoea, Herpes, HBV, HIV, Influenza.

SYLLABUS FOR SECOND YEAR MEDICAL LABORATORY TECHNOLOGY COURSES -

B.Sc Medical Laboratory Technology

PATHOLOGY —2' Year

Theory:-Histopathology and Haematology

Histopathology Instrumentation: (a) Automated Tissue Processor (b) Microtomes, Knives, Knife sharpeners and Ultramicrotome (c) Freezing microtome and Cryostat (d) Automatic slide stainer
Techniques : (a) Routine paraffin section cutting (b) Frozen section and Cryostat section studies
Staining techniques: Special stains for Carbohydrates, Connective tissue, Nervous tissue, Bone tissue, Collage fibers, Elastic Fibers, Lipids, Organisms, fungi. parasites, pigments and deposits in tissues
Mounting techniques: Various mounts and mounting techniques Electron Microscope, Scanning electron microscope, Dark ground and Fluorescent microscope Museum technology
Microphotography and its applications Maintenance of records and filing of slides ICDS Classification and coding Application of computers in Pathology

Hematology

Hemopoiesis, Stem cells, formed elements and their functions Anticoagulants used in various hematological studies Routine hematological tests and normal values:

(a) Determination of Haemoglobin and Haematocrit

(b) Enumeration of RBC, WBC & Platelets

(c) Absolute Eosinophil count

(d) Reticulocyte count

(e) Calculation of Red cell Indices

(f) Preparation of staining of blood film for morphology of red cells and differential count

Special Hematological tests:

(a) Sickling tests (b) Osmotic fragility test (c) Determination HbF and HbA2 (d) Haemoglobin

Electrophoresis (e) Investigation of G6PD deficiency (f) Plasma haptoglobin and demonstration of

hemosiderin in urine (g) Tests for Autoimmune hemolytic anemia (h) Measurement of abnormal Hb

pigments

Haemostasis and Coagulation

(a) Normal hemostasis, mechanism of blood coagulation and normal fibrinolytic system (b) Collection of blood and anticoagulants used in coagulation studies (c) Investigation of hemostatic mechanism-

BT, CT, whole blood coagulation time test, PT, PTT (d) Assay of clotting factors (e) Tests for fibrinolytic activity- Euglobulin , clot lysis test and FDP (f) Platelet function tests Investigation of Megaloblastic anemia and Iron deficiency anemia (a) B12 and Folate assay and Schilling test (b) Estimation of serum iron and iron binding capacity

Bone marrow biopsy study

(a) Needle aspiration and surgical biopsy technique (b) Preparation of smears and staining

Demonstration of LE cells

Cytochemistry

Administration in Haematology and Quality control

Practical's:

1. Paraffin section cutting 2. Staining by Hematoxylin & Eosin and other special stains 3. Determination of Hemoglobin and Hematocrit 4. Red blood cell count 5. Total white blood cell count 6. Platelet count 7. Differential count of white blood cells 8. Absolute Eosinophil count 9. Reticulocyte count 10. Calculation of red cell indices 11. Determination of ESR 12. Determination of BT, CT, Whole blood clotting time 13. Determination of PT and PTT 14. Blood smear preparation and staining 15. Osmotic fragility test 16. Sickling test 17. LE cell preparation 18. Test for G-6PD

THIRD YEAR
SYLLABUS FOR THIRD YEAR MEDICAL LABORATORY TECHNOLOGY COURSES – RUHS
B.Sc Medical Laboratory Technology

BIOCHEMISTRY 3 YEAR
THEORY

1. Liver Function tests. Role of the Liver in metabolism, formation of bilirubin and mode of excretion.
2. Gastric Analysis: of gastric juice, concepts of free and bound acids. Gastric acid .
3. Renal function, Renal function test and renal clearance test.
4. Calculi: Theory of formation and analysis, Renal clearance concentration and application of phenolsulfonphthalein
5. Acid - Base balance and its disturbances.
6. Inorganic ions: Calcium metabolism, phosphate metabolism. sodium-potassium balance and trace element (Fe, CU).
7. Metabolism of proteins and amino acids.
8. Over view & replication, translation, transcription and genetic engineering.
9. Metabolic disorders: a Amino acids b Proteins c. Inborn errors of metabolic disorders.
11. Clinical enzymology.
12. Radio isotope techniques' Principle, definition of units, measurement of radiation standards, crystal counting. Resources and applications.
13. Immunoassay: Different methods, principle and applications.
14. Biostatistics: Population mean: Correlation Coefficient, Standard deviation. Standard error.

PRACTICALS:

1. Specimen Collections: Urine, Blood, Gastric juice,
2. Accuracy, precision and quality control - Demonstration and preparation of two methods using histogram, F-test and Barr test.
3. Enzymes: amylase (salivary and Pancreatic), Alkaline Phosphatase, Acid Phosphatase, SGOT, SGPT, LDH and CPK- demonstration on auto analyser.
4. Liver function tests: estimation of Bilirubin - total and conjugates, Urobilinogen,
5. Gastric analysis: Determination of free and total acid, gastric stimulation
6. Lipid determination of serum lipids - cholesterol, triglycerides and lipoprotein fractionation.
7. Inorganic ions - Determination of calcium in serum and urine, 'serum phosphates, sodium and potassium chloride.
8. Analysis of calculi
9. Urine - screening for inborn errors of metabolism
10. RFT
11. Cardiac markers (Relevant charts on the above topics for interpretation and diagnosis)

SYLLABUS FOR THIRD YEAR MEDICAL LABORATORY TECHNOLOGY COURSES - RUHS

B.Sc Medical Laboratory Technology

MICROBIOLOGY 3 Year

SYSTEMIC BACTERIOLOGY, IMMUNOLOG -APPLIEL :BACTERIOLOGY IMMUNOLOGY

1. Infection 2hrs

2. Immunity 4 Hrs. A. Innate immunity B. Acquired immunity (adaptive immunity) C. Active and passive immunity-1. Natural acquired active immunity 2. Artificial acquired active immunity

3. Natural acquired passive immunity - Breast feeding

4. Artificial acquired passive immunity

3. Cell mediated Immune System

A. 1. Cell development 2 B lymphocytes (general knowledge of their role) a. Bursa of Fabricius b. Stem cell differentiation c. Gut-associated lymphoid tissue (GALT)

3. T lymphocytes

a. Stem cell differentiation (general knowledge of their role)

b. Cytotoxic T (TC) cells

c. Delayed-type hypersensitivity T (TD) cells

d. Helper T (TH) cells e. Suppressor T (TS) cells

4. Natural killer cells

B. Dual nature of the immune system

i. Humoral immunity

ii. Cell-mediated immunity

C. General properties of immune responses

1. Recognition of self versus nonself

a. Clonal selection theory B-cells

b. Tolerance

c. Clonal deletion

2 Specificity

a. Definition

b. Cross-reactions

3. Heterogeneity

4. Memory

a. Memory cells

b. Anamnestic response

4. Humoral Immunity-General characteristics

1. Antigen types 2. Antigen sensitization 3. Plasma cells

5. Antigen & Antibody(04 Hrs.)

1. Antigens

2. Epitopes (antigenic determinants)

3. Hapten

4. Antibodies consequences of antibody binding

5. Titer

6. Immune Response

A. Properties of Antibodies (immunoglobulins)

1. Light chains 2. Heavy chains 3. and variable regions 4. Antigen binding sites 5. Fab and Fc regions

B. Classes of immunoglobulins 1. IgG 2. IgM 3. IgA - a. J chain, b. Secretory piece 4. IgE 5. IgD 6. Antibody titer

C. Primary and secondary responses 1. Primary response 2. Secondary response

D. Kinds of antigen-antibody responses

E. How humoral responses eliminate foreign antigens

1. Basic mechanisms

a. Agglutination b. Opsonization c. Activation of complement* Do not worry about the detailed mechanism of complement Know that it makes a membrane attack complex and what that is.
d. Neutralization

2. Summary of humoral immunity

7. Monoclonal Antibodies

A. Production

1. Hybridoma formation 2. Cloning of cells

B. Uses

1 Research tools 2. Diagnostic uses 3. Therapy

8 Cell-Mediated Immunity

A. General characteristics

B. The cell-mediated immune reactions

1 Antigen processing

2 Helper T (TH) cells a. TH1 (inflammatory T) cells b. TH2 cells

3. Suppressor T (TS) cells. 4. Cytotoxic (killer) T (TC) cells

5. Natural killer (NK) cells 6. Memory T cells Lymphokine release

C. Superantigens

9 Factors That Modify Immune Responses

A. Compromised host

B. Modifying factors 1. Age 2. Stress 3. Diet 4. Exercise 5. Injuries 6. Environmental factors

10. Hypersensitivity reactions

11. Autoimmune disorders

12. Transplantation immunology

13. Antimicrobial Sensitivity, Disk diffusion and Dilution 3 Hrs.

14. Bacteriology of Water. Milk and Air 5 Hrs.

15. Systematic Bacteriology(75 Hrs.) Classification, Morphology, Genotypic & Phenotypic characteristics, Pathogenesis, Disease caused.

Lab Diagnosis & Prophylaxis

A Gram Positive Bacteria i. Staphylococcus ii. Streptococcus Pneumococcus iv. Corynebacteria v. Clostridia vi. Bacillus vii. Listeria viii Actinomyces ix. Nocardia

B. Gram Negative Bacteria i. Neisseria ii. Enterobacteriaceae Escherichia iv. Klebsiella v. Enterobacter vi Proteus vii. Salmonella viii. Shigella ix. Yersinia x. Pseudomonas xi. Haemophilus xii. Brucella xiii. Pasturella xiv. Legionella xv. Bordetella xvi. Burkholderia xvii. Gardnerella xviii. Vibrio xix. Campylobacter xx. Helicobacter xxi. Bacteroides xxii. Fusobacterium

C. Spirocheates i. Treponema Borrelia iii. Leptospira

D. Mycobacteria i. M.tuberculosis M.leprae i. Atypical Mycobacteria

E. Mycoplasma

F. Chlamydiae

G. Rickettsiaceae

H Applied microbiology- Diseases. I Molecular techniques in diagnostic microbiology- PCR, DNA hybridisation

Desirable to know: (There will be no main questions or short notes from this portion. One paper may have only one question under short answers i.e. 3 marks)

a. Erysipelothrix 1.Propionibacteria 2.Rhodococcus 3. Tropheryma 4. Moraxella 5. Serratia 6. Stenotrophomonas 7. Acinetobacter 8. Streptobacillus 9 Parvobacteria

PRACTICALS FOR 3rd YEAR BACTERIOLOGY

1. Staining. a. Grams staining b. ZN staining c. Alberts staining
2. Hanging drop preparation
- 3 Culture methods
4. Introduction to biochemical reactions
5. Identification of bacterial culture a. Colony characteristics b. Morphological characteristics c. Motility study d. Interpretation of biochemical reactions
6. Antibiotic sensitivity testing- Kirby Bauer method
7. Applied bacteriology- exercise
8. Immunology: Serological tests: a. Specimen collection b. Principle c. Methods. d. Procedure e. Normal values/ Significant titer f. Interpretations g. Limitations of all the following tests i Widal ii ASO iii CRP iv RPRNDRUTRUST v RA vi HBsAg /anti HIV detection vii ELISA

SYLLABUS FOR THIRD YEAR MEDICAL LABORATORY TECHNOLOGY COURSES - RUHS
B.Sc Medical Laboratory Technology

PATHOLOGY 3rd Year

Cytology, Automation in cytology, Cytogenetics, Cytochemistry Immunohematology and Blood transfusion

Cytology

1. Normal cell structure. function, cytologic criteria of malignancy
2. Types of specimens. methods of collection & preparation of cell block
3. Different fixatives and methods of fixation
4. Staining . (a) Papanicolaou's stain- principle , preparation and staining techniques (b) May Grunwald Giemsa stain (c) Shorr's stain (d) Aceto orcin stain

Female Genital tract

1. Anatomy, Histology, Physiology & normal cytology
 2. Techniques of collection of specimen for cervical cytology study
 3. Hormonal cytology and cytological indices
 4. Cervical cytology screening for malignant and non-malignant conditions , Radiation changes & follow up
 5. Cytology of Endometrium - normal , nonmalignant and in malignant conditions
 6. Cytology in Ovarian cancers ,Respiratory tract, Gastrointestinal tract and Urinary tract
- 1 Anatomy, Histology and Physiology 2. Collection of sample, preparation of smears and staining 3. Cytology of normal, nonmalignant & malignant conditions

C S F and Effusions

1. Cytology of CSF in inflammatory, nonmalignant & malignant conditions 2. Cytology of effusions in non-malignant and malignant conditions Glands - Breast, Thyroid, Salivary glands and Lymph nodes
1. Anatomy , Histology and Physiology
 2. Fine needle aspiration cytology of glands and other soft tissue mass
 3. Cytologic features in nonmalignant and malignant conditions of different glands and nipple discharges

Automation in Cytology 1. Flow cytometry 2. Image Analysis 3. Principles, Equipments, procedures & Evaluation

Tissue culture and Immunohistochemistry 1 Equipments for Tissue culture studies (a) Laminar air flow equipment (b) Carbon dioxide incubator (c) Inverted microscope 2 Derivation of culture from tissue (a) Enzymatic digestion of tissue using collagenase, protease (b) Plating in tissue culture media (c) Observation of cells in Invertoscope (d) Subculturing & derivation of cell lines

3. Characterization of cell lines (a) Determination of biochemical markers in cells (b) Chromosomal & DNA content of cells (c) Immunological properties of cells

4. Preservation of immortalized cell (a) Storage in Glycerol in Liquid Nitrogen (b) Storage in Dimethyl sulfoxide in Liquid Nitrogen

Cytogenetics

1. Introduction to cytogenetics, terminology, classification and nomenclature of hum, chromosomes
2. Methods of karyotypic analysis (a) Culture of bone marrow cells peripheral blood lymphocytes, solid tumors fibroblasts (b) Direct preparation from tumor materials
3. Characterization of human chromosomes by various banding techniques
4. Sex chromatin identification
5. Chromosomes in neoplasia and oncogenes

Immunocytochemistry

1. Basics concepts, monoclonal antibodies & preparation
2. Fluorescence reactions Immunohematology and Blood transfusion
 - 1 ABO Blood group and Rh system
 2. Subgroups of A and B . Other blood groups and Bombay group
 3. HLA antigens and their significance
 4. Principles of Blood transfusion: (a) Blood donor selection (b) Methods of bleeding donors (c) Blood containers, anticoagulants and storage of blood (d) Coomb's test and its significance (e) Screening of blood for transfusion transmitted diseases (f) Blood components, preparation & component therapy (g) Autologous transfusion (h) Transfusion reactions and work up (i) Blood bank organization, standards, procedures, techniques, quality control & record keeping

Practical's

1. Preparation of various cytology smears and fixation
2. Papanicolaou's and May Grunwald Geimsa staining
3. Hormonal cytology study
4. Blood grouping and Rh typing
5. Cross matching techniques
6. Screening of Donor's blood for infective agents
7. Transfusion reaction work up
8. Preparation of blood components