Diploma in Laboratory Technology

1st Year

PAPERS CODE	PAPERS NAME	INTERNAL	EXTERNAL	TOTAL
1DLT01	ANATOMY & PHYSIOLOGY	40	60	100
1DLT02	MICROBIOLOGY & PARASITOLOGY	40	60	100
1DLT03	HAEMATOLOGY & BLOOD BANKING	40	60	100
1DLT04	BASIC TECHNOLOGY & ETHICS	40	60	100
1DLT05	BIOCHEMISTRY & CLINICAL PATHOLOGY	40	60	100
1DLT06	HISTOPATHOLOGY & CYTOLOGY	40	60	100
LAB/PRACTICAL				
1DLT07	ANATOMY & PHYSIOLOGY PRACTICAL	60	40	100
1DLT08	MICROBIOLOGY & PARASITOLOGY PRACTICAL	60	40	100
1DLT09	HAEMATOLOGY & BLOOD BANKING PRACTICAL	60	40	100
Total		**300**	**300**	**600**

PAPER -1 ANATOMY & PHYSIOLOGY (101)

Anatomy (Theory):-

1. Introduction:-

(a). Common Anatomical terms & Anatomical Positions. Different parts of the human body (b) Tissue with Function & Classification (c) Cell & Animal Cell (2.) Skeletal system: (a) Bones, joint, & Movement (b) Muscles (3) Genito- Urinary System:(a) Male & Female Reproductive Organic System (b) Urinary bladder, Kidney and Ureter (C). Uterus & Urethra

(4) Respiratory System(a) Lungs & Thoracic Cavity(b) Pleura (c) Surface marking of lungs

(5) Gastro-Intestinal System:-(a) Mouth (b)Pharynx & Salivary gland and Tonsils (c)Oesophagus &stomach(d) Spleen & Pancreas (e) Gall Bladder & Liver (f) Surface making of Abdomen (g) Structure of Digestive Tract

(6) Movement of the body(a) Upper Limb –Bones, Important Vessels (b) Lower Limb –Bones Important Vessels

(7) Nerves System(a) C.S.F & Spinal Card (b) Nerves & Brain(c) SympatheticAnd Sympathetic (d) Cranial and Spinal Nerves

(8) Cardio –Vascular System(a) Arterial System (b) Lymphatic and Venous System (c) Heart (d) Surface Making, Important Blood Vessels & Muscles(e) Pericardium

Physiology (Theory)

1. Digestive System(a) Mastication deglutition(b)Function and Composition Saliva (c) Function of Stomach (d) Function and Composition of gastric juice (e) Function of Pancreatic Juice (f) Function of Bile

(2) Respiratory System(a) Define-Respiratory Rate(b) Vital Capacity, Cyanosis (c)External & Internal Respiration (d) Transport of O_2 and CO_2 in the Blood (e) Function of Respiration its structure

(3) Blood(a) Function of Blood (b) Composition of Blood (c) Anti-Coagulants(c)Description of Blood Cells(e) Blood Group of A B C O and Rh Factor(f) Function of Lymph (g)anaemia and its Type

(4) Cardio- Vascular System(a) Define of Cardio output(b) Define the blood pressure, Electrocardiogram (e) Circulation (Systematic and Pulmonary) (f) Function of Heart (g) Function of Blood vessels (h) Cardio Cycle

(5) Excretory System(a) Kidney (Function)(b) Formation of Urine (Normal and abnormal)(c) Composition of Urine

(6) ENDOCRINE GLAND(a) Define- Name and hormones Secreted by than (b) Action of Hormones in our body

(7) Reproductive System(a)Male female Genital System(b) Function of Ovary(c) Formation of Ova and Their action of ovarian Hormones(d) Function of Testis- Their action of Testosterone(e)Mensuration Cycle and Fertilization (f)Progesterone and Oestrogen Hormones

(8) Skin(a) Define the Skin (b) Function of Skin

(9) Formation, Function &Composition of C.S.F

(10) Special Senses-Smell, Taste, Touch, Hearing

Paper – 2; MICROBIOLOGY & PARASITLOGY:-(102)

MICROBIOLOGY (Theory)

Microbiology is the branch of science that deals with study of Virus, Bacteria and Fungi which cannot be seen through naked eye.

Morphology of Bacteria

1. Structure & Growth of Bacteria
2. 2..Classification of Bacteria
3. Nutrition of Bacteria
4. Staining of Bacteria
(a) Gram stain, Negative Stain, Ziehl – Neelsen, Albert, Spore Stain.
(b) Composition and preparation of staining Reagents and their composition.
5. Gram Negative Cocci
(a) MeningoCocci&GonoCocci
6. Gram positive – Cocci
(a)staphyloCocci(b)StreptoCocci(c)PneumoCocci
7. Gram Bacilli
(a) Salmonella (b) E-coli
(c) Pseudomonas (d)Shigella
(e) Klebsiellla (f)Haemophilus
8. Gram Positive Bacilli
(a) Anaerobic Bacilli – Clostridia
(b) Aerobic – Mycobacterium Tuberculosis and Myeobacteriumleprae. And Corynebacterium diphtheria.
9. Bacterial Metabolsim :
(a) Requirement of Bactria ,(b)Aerobic (c)Anaerobic(d) Growth
10. Morphology of Fungi :
(a) Cultivation of Pathogenic Fungi (b) Gandida (C) Dermatophytes (d) Asperigillus
11.Water :
(a) Collection of water, Packing and dispatching of water sample.
12.Bacteriological Examination of :
(a) Examination of Pus, Abscess and wounds
(b) Milk (c) Air (d) water
13.Cultivation of Micro- Organism :
(a) Culture Medica (i) Composition (ii) Classification
14. Isolation and Inoculation according Techniques
Biochemical Test
 Test of Metabolism of Protein , amino acid , production of enzymes
 VP teat , MR test , Catalase test , Coagulates Test
 Gram stain, Negative Stain, Ziehl – Neelsen, Albert Stain.
Parasitology–(Theory)
“It is branch of medical science dealing with study of various human parasites.”
1. Morphology, Life Cycle, Symptoms Clinical Diagnosis & Laboratory Diagnosis
(a)Hook Worm (b)Round worm (c)Tape worm (d)Ent. Amobea-Histolytica(e)Entameoba
Coli(f)Plasmodia(g)Leishmania- donovani (h)Giardia- Lambila
Serology:(a)pregnancy Test(b)Widal Test(c)V.D.R.L Test (d)Elisa for HIV- I & II(e)RA & ASO Test

Paper 3: HAEMATOLOGY & BLOOD BANKING (103)
HAEMATOLOGY:-
1. Introduction of Haematology
2. Collection of Blood
3. Red Cell Count (i) Method (ii) Calculation (ii) Haemocytometer
4. White cell count (T.L.C) (i) Method and Calculation
5. Differetal Leucocyte Count (D.L.C)(i)Normal Value and Morphology of White Cells (i) Counting Method (iii) Staining Procedures

6. Packed Cell Volume (i) Normal Values & Macro & Micro Method
7. Estimation of Haemoglobin
Method-S.G, Chemical, Colonimetric&Gasometric etc. and Clinical Importance
8. Anticoagulation, MCV,MCH & MCHC & its Importance
9. Morphology of Normal abnormal Red cells
10. Method, Appearance & Normal Calues Reticulocyte Count
11. Coagulation Tests (i) Bleeding time, Prothombin Time WBC Coagulation time (ii) Clot Retraction Test, Platelet Count
12. Total Platelet Count (T.P.C) with Direct & Indirect Method
13. Urine Analysis (a)Physical, Chemical, Microscopic& Normal
14. Stool Examination (i) Microscopically Examination of Stool (ii) Chemical Examination Stool (iii) Deference between Amoebic and bacillary Stool
15. Seman Analysis (i) Microscopical Examination of seman (ii)Normal & Abnormal Morphology of Spermatozoa. (iii) Motility & Total Sperm Count (iv) Macroscopical Examination of Seman (Amount of Seman, Colour, Rection, Viscocity)
16. Anaemia and Leukemia (a) Common Anatomical terms & Anatomical Position Blood Banking
1. Blood Collection (i) Collection of Blood (ii) Storage of Blood (iii) Anticoagulation use for collection of Blood (iv) Screening of doner
2. ABO & Rh Blood Group System – (i) ABO Grouping by Slide Method & Tube Method (ii) Antigen and type of Antibodies (iii) Rh system with slide method (iv) Type of Antibodies (v) One/Two stage Albumin Technique for Rh Factor
3. Cross Machine (i) Open slide Method (ii) Albumin tube Technique
4. Coomb,s Test (i0 Direct (ii) Indirect
5. Drawing of Blood for Donor
6. Blood Transfusion and its Reactions
7. Administration of Blood Bank

Paper-1; Theory:- BASIC TECHNOLOGY & ETHICS (201)
1. Microscope-Principal, Operation, care and use
2. Sterilization: General Principal of Sterilization, Classification, Physical, Mechanical Chemical Method, Sterilization Media, Syringes, Glassware and Apparatus Rote of laboratory in the health Duties and responsibility of lab technician (a) General Duties (b) Specific Duties
3. First Aid and Safety Measures: (a)Aims and type and Diagnosis of First Aid (b) safety Measures- Biological, Electrical ,Mechanical Chemical
4. Cod of Professional Conducts
5. Immunity: Types, Factor Effecting Immunity
6. Collection preservation and Storage of different body fluids
7. Communication: Public Relation, Patient relation and Physician, nursing staff relation, report and record
8. Quality Control
9. Instrument (Internal): Hot air Oven, Auto-Clave
10. WHO and PHC
Ethics: Importance, Principle, Consideration

PAPER-02; Histo-technology(202)
Theory 1. Introduction
2 Examination Method of Cell & Tissue
3. Tissue Processing (i) Collection of Specimen (ii) Fixation (iii) Labelling and Clearing (iv) Dehydration

4. Fixation of Tissue (i) Simple Fixative and Cytological Fixative (ii) Micro Anatomical Fixative
5. Staining (a) Staining of Tissues section (b) Theory of staining (c) Mounting of section (d) Staining Technique
6. Section Cutting (i) Microtome and their Knives (ii) Mounting Section (iii) Techniques of section cutting
7. Reception of Specimen, Preparation & Fixation and Restoration of colour according Museum Technique
8. Autopsy Techniques (i) Processing of Tissues (ii) Preservation of Orange

Paper-01 ; BIOCHEMISTRY & CLINICAL PATHOLOGY.(301)

Course Description Student should leave knowledge of carbohydrate
1. Protien and lipids vitamin. Minral and hormones as well as the relevant diagnostic tests.
Theory:-
Carbohydrates digestive and absorption metabolism of glucose glycolysis gluconeonesis . glycogen Formation and breakdown stroge diseases maintinace of blood suger leave hormonal influence,mellitus,inter conversion of mono saccharides(12hrs)
2. Digestion of protiens, urea synthesis, transminnation, metabolism of the following amion acid Aromatic amino acid, sulphar containing amino-acid oxidation of fatty acid lipoproteins(9hrs)
3. digestion and absorption of lipids. Synthesis of fatty acid acid oxidation of fatty acid liporprotiens.
4. Hormones Role of biological important hormones. Insulin glucose, epinephrine,thyroid growth hormones steroid hormones.
5. Chemistry and biological role of Vitamins (7 hrs)
6. Minral metabolism iron,copper,calcium,mangnesium,phosphorus sodium,potassium,chloride,iodine (9 hrs)
7. ETC and oxidative phosphorylation (3 hrs)
URINE
1. Composition of urine
Collection and preservation of urine
Changes in composition of urine relation to varises disease principal of dry chemistry
PRACTICAL
Complete urine analysis
a. Physical
b. Chemical Protein
Reducing substances
Ketone bodies
Blood pigments
Bile
c. Sediments
Use if dip sticks in urine analysis
2. Cavity fluids and miscellaneous specimens extra vascular fluids, normal composition transudations and exudates
3. Cerebrospinal fluids and alteration in diseases
4. Semen analysis
5. Non- parasitological examination of stool including occult blood
6. Quality control-urine and extra vascular fluids
PRACTICALS:
1. Examination of CSF and reporting

2. Examination of cavity fluids and reporting
3. Semen analysis
4. Stool-Occult blood
5. Stool routine
6. Urine for Urobilinogen
7. Urine Bile salt, Bile pigment

Paper (02); 2-HISTOPATHOLOGY & CYTOLOGY (302)

COURSE DESCRIPTION A the end of the course the student will be able to fix process. Embed tissue and make section for microscope student. He/She will also competent to make routine cytological preparation.

THEORY

Introduction to histo pathological techniques
Reception of specimens
Fixation formalin fixatation
Tissue processing and embedding
Section cutting
Mounting and staining
Theory of H & E staining
PAS & PAP staining principal and uses
Stains for AFB [TB and leprosy]
Theory of frozen section prep ration

CYTOLOGY

THEORY

Principal of exfoliate cytology
Fixation of smears
PAP staining and identification of cells in a normal veginal smear
Preparations of smear of fine needle aspiration cytology

PRACTICALS

Embedding and preparation of blocks
Section cutting and use and care of microtone
H & E staining
PAS staining
AFB staining [TB and leprosy}
Frozen section and care of ctyosist
PAP staining MGG staining for fnac