M. Voc. Medical Laboratory Technology

(02 Years Duration) with 04 Semesters

SEMESTER - I

Component	Title of The Paper	Credits
Theory		
Paper - 1	Human Anatomy & Physiology (Theory)	04
Paper - 2	General Biochemistry (Theory)	06
Paper - 3	Bacteriology & Mycology (Theory)	06
Paper - 4	Haematology and Clinical Pathology (Theory)	06
Practical		
Paper - 1	Human Anatomy & Physiology (Lab)	02
Paper - 2	General Biochemistry (Lab)	02
Paper - 3	Bacteriology & Mycology (Lab)	02
Paper - 4	Haematology and Clinical Pathology (Lab)	02
	Total Credit	**30**

M. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Paper - 1) Human Anatomy & Physiology (Theory)

Credits – 04

HUMAN ANATOMY&PHYSIOLOGY

Unit-I Skeletal System:

Bones—Types, Structure and Growth Division of the Skeleton

Appendicular skeleton Axial skeleton

Names of Bones and their parts Joints Classification

Types of movements with examples, **Sensory organs** Structure and Functions

Unit-2 Digestive System:

Components of digestive system Alimentary tube

Anatomy of organs of Digestive Tube-Mouth

Tongue Tooth

Salivary Glands,Liver

Biliary apparatus Pancreas, Intestine

Digestion and Absorption of food and it excretion

Role of Bileindigestion and excretion Liver function

Unit-3 Respiratory System:

Anatomy of gastrointestinal tract, components of G I tracts, Oral cavity, Tonsils, Pharynx, Alimentary canal, Salivary glands .Anatomy of Digestive system, Stomach, Small & Large intestine, Liver, Gall bladder, Pancreas, Spleen, Biliary apparatus. Respiratory system Larynx Bronchi Lungs Cardio vascular System: Anatomy and Physiology of Heart, Arteries and Veins Circulation- System atic and pulmonary Chambers, Applied Anatomy.

Unit-4 Central Nervous System:

Anatomy of Nervous system, structure of Neurons, parts, Classification, of CNS, Structure of Human brain, (HIND,MID & FORE BRAIN), Location, functions, & covering of brain, Spinal cord structure, functions, PNS, ANS, Sense organs, spinal & Cranial nerves. Brain Spinal Cord and endocrine system, Various glands, structure, functions, blood supply, Applied Anatomy.

M. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Paper - 1) Human Anatomy & Physiology (Practical)

Credits – 02

HUMAN ANATOMY&PHYSIOLOGY

- Demonstration of Skeletal System, Organs of Body, Sensory Organs
- Study of Digestive Systems organs
- Handling and demonstration of alimentary canal, Stomach, Liver, Pancreas, Gall bladder, Lungs, Thyroid, pitutary, Adrenal glands, Heart and Trachea

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SEMESTER-I

(Paper - 2) General Biochemistry (Theory)

Credits – 06

General Biochemistry - I

Unit-1 Biomolecules Carbohydrate: Structure, Classification: Monosachharides, Oligosaccharides, polysaccharides, Isomerism&Properties Proteins: Structure, Primary, Secondary, Quarternary and Tertiary, Classification &Properties, Plasma Proteins: Structure, functions.

Unit-2 Lipids: Structure, Classification &Properties, Functions, Cholesterol, Triacylglycerol, Phospholipids,.

Unit-3 Nucleic Acids:Structure of Purine & pyrimidine basesNucleotide &Nucleosides,DNA & RNA:Structure&Properties,Differences,functions.

Unit-4. Enzymes: Classification, Factors affecting enzyme activity, & diagnostic importance, Enzyme action & their mechanism, Enzyme inhibition; Types, Mode of action for related enzymes

Unit-5. Water, Electrolytes and Acid – Base balance: Buffer systems and their role in regulating the pH of body fluids. Conditions associated with abnormal acid-base status.

Unit-6. Biological Oxidation, ETC, oxidative phosphorylation.

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SEMESTER-I

(Paper - 2) General Biochemistry (Practical)

Credits – 02

General Biochemistry – I

- **Estimation of Glucose by GoD – PoD**
- **Estimation of total protein by biuret method**
- **Estimation of albumin by BCG method**
- **Estimation of SGOT and SGPT**
- **Estimation of Lipid profile**
- **Blood gas measurement.**

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SEMESTER-I

(Paper - 3) Bacteriology & Mycology (Theory)

Credits – 06

Unit-1.Introduction to Bacteriology: History and scope of Microbiology Contribution of Anatomy Von Leeuwenhook ,Louis Pasteur, Alexender Fleming in the development of Microbiology Morphology and ultra structure of bacteria. Bacterial cellwall of eubacteria and archaebacteria Cellmembranes–Structure, Composition and Properties **Bacterial Nutrition:** Nutritional groups Common nutritional requirements, Growth of bacteria under extreme conditions Psychrophiles, Thermophiles, Halophiles Acidophiles Bacterial reproduction Binary fission Endospore formation **Bacterial Growth:** Bacterial growth curve, nutrition of bacteria 3. Bacterial metabolism, Bacterial genetics, Antibiotics & Drug resistanceGeneration time Growth Kinetics–Synchronous, Batch and continuous cultures Measurement of growth Factors affecting growth.

Unit-2.Bacterial infection,Microbiology of Air, Water, Milk and Mild common pathogen encountered Microbiological analysis and methods for purification of water and air. SYSTEMIC BACTERIOLOGY: 1. Cocci (Gram positive & Gram negative) Staphylococci, Streptococci, Neisseria. 2. Gram-positive Bacilli : Anthrax, Diphtheria, and Clostridia. 3. Mycobacteria : Tuberculosis and Leprosy. 4. Gram Negative Bacilli : Enterobacteriaceae, Vibrios, Brucella, Bordetella, Haemophilus, Pasteurulla, Non-sporing anaerobic bacteria. 5. Spirochaetes : Leptospira, Borrelia and Treponema. 6. Bacterial Infections And Diagnosis: a. Wound infection, Postoperative infection b. Urinary tract infection c. Respiratory tract infection d. Diarrhoeas and food poisoning e. Infections of CNS f. Hospital acquired infections.

Unit-3.Microbial Classification: Basic ofmicrobial classificationClassification and salient featuresofbacteria according to Bergey'smanualofdeterminativebacteriology.Kingdom fungi Structure,reproduction and classification of fungiGeneralcharacteristicsand life cycle-ZygomycetesAscmycetesBasidiomycetesDeuteromycetes**Bacteriophages:** Classification,Morphology andultrastructureOne stepgrowthcurve (Latentperiod,eclipse period and burst size)Life cycle—LyticandLysogeniccyclesofbacteriophages

Unit-4.Mycology: Classification of Fungi Growth and isolation Mycoses (alltypes)Laboratory diagnosis of mycotic diseases. Immunity in fungal diseases and value of immunodiagnosis. Role of mycotoxin Antifungal agents Epidemiology of fungal diseases.

Unit-5. Classification of Fungi Growth and isolation Mycoses (alltypes) Laboratory diagnosis of mycotic diseases. Immunity in fungal diseases and value of immunodiagnosis. Role of mycotoxin Antifungal agents Epidemiology of fungal diseases.Introduction about Fungi. Names of the fungi and the diseases caused by them. Superficial mycoses, Candida, dermatophytes, opportunistic fungi, subcutaneous mycoses, Cryptococcus.Introduction to fungi - briefly describe Dermatophytes, Opportunistic fungi,Subcutaneousfungi,dimorphicfungi,Candida andCryptococcus.

Unit-6. Control of Microorganism:Chemical controlofmicroorganism—Heat,Filtration and RadiationSterilizationofSoaps,DetergentsandDyes.Chemicalcontrolofmicroorganisms-Halogens,PhenolandPhenoliccompoundsHeavymetals,Alcohols,EthyleneOxideAldehydesandHydrogenPeroxide

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SEMESTER-I

(Paper - 3) Bacteriology and Mycology (Practical)

Credits – 02

- Sterilization methods
- Grams staining, AFB Staining, Absent staining
- Preparation of culture media (all types)
- Urine culture and sensitivity
- Demonstration of Bacterial slides
- ELISA
- Cultural of Bacterial and fungal organism

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SEMESTER-I

(Paper - 4)Haematology and Clinical Pathology (Theory)

Credits – 06

Unit-1. RedBloodCells: NormalmorphologycountIsolationfromwholeblood&countEffecton count&morphologyofphysiochemicalparameters&thediseasedstateRedcellanomalies &theirrelevancew.r.t.normal&diseasedstate**RedCellMassStudies:**ChemicalMethod &Radioactive MethodsRedCellfunctionstudies

Unit-2. Stains used in Haematology Morphology of red cells Morphology of leucocytes and platelets Preparation of buffy coat smears eticulocyte count Laboratory methods used in the investigation of deficiency anaemias B12 and Folate assay Schilling test Serum iron and iron binding capacity

Unit-3. Laboratory methods used in investigation of haemolytic anaemias a) Osmotic fragility b) Test for sickling c) Estimation of Hb-F, Hb A2 Organization and quality control in haematology laboratory

Unit-4. Anemia: DefinitionTypesofanemia&theirclassification Physiochemical,characteristic featuresEtiologyofaplasticanemia Clinicalfeatures&diagnosisHemolytic, Megaloblastic Bone Marrow (a) Techniques of aspiration, preparation and staining of films (b) Bone marrow biopsy.

Unit-5. Leukaemia: Morphology count&methodsofisolationEffectoncount&morphology of cellby the physiochemicalparameters,Diseased State & the relevance of condition ofthe diseasesDefinitionClassificationofleukaemia FABclassificationEtiologyPhysiochemical features of different type of leukaemia with reference to clinical statesDiagnosis of different types ofleukaemias

Unit-6. CLINICAL PATHOLOGY: 1) Urine examination. Physical, Chemical and Microscopic examination. 2) Examination of faeces for occult blood 3) Examination of body fluids, cell counts. 4) Semen analysis 5) Sputum examination

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SEMESTER-I

(Paper - 4)Haematology and Clinical Pathology (Practical)

Credits – 02

- RBC count, WBC count DLC count
- Hb estimation, Demonstration of Slides of different haemolytic disorders
- Slides demonstration of leukaemia
- Blood grouping estimation
- CLINICAL PATHOLOGY: Complete Urine Analysis Cavity Fluids and miscellaneous samples Cerebrospinal Fluid in Health & Disease, Semen analysis, Stool examination for Occult blood, HAEMATOLOGY Complete Haemogram, Bone marrow smears - staining and examination