

DIPLOMA IN MEDICAL LABORATORY TECHNIQUES AND MANAGEMENT

(Non-Semester)

(With effect from the academic year 2013-14)

Eligibility for the Course

Candidates for admission to Diploma in Medical Laboratory Techniques and Management could possess a Bachelors degree in Zoology, Botany, Chemistry, Biochemistry, Microbiology Biotechnology/Environmental/ Animal/plant Food sciences, Dietetics & Nutrition, Bioinformatics, BE in Chemical Engineering & Biotechnology; B.Tech in Biotechnology & Bioinformatics/Nanotechnology; BDS; MBBS; B.Sc in Agri/Agri Biotechnology;B.V.Sc., B.F.Sc., .Pharm and BPT.

Duration of the Course

One year Diploma in Medical Laboratory Techniques and Management course non-semester for One Year duration

Examination

All the theory paper are of 3hours duration each for maximum of 100 marks with passing minimum of 35 marks Practical examinations are also for 3 hours duration for a maximum of 100 marks and passing minimum of 35 marks.

Question Paper Pattern

Maximum marks: 100

Time: 3 hours

Part A (5 x 3 = 15)

Five short answer questions (One question from each unit)

Part B (5 x 8 = 40)

Paragraph questions (Total questions 8, out of which answers are to be given for any five questions;

Part C (3x 15 = 45)

Total questions 5, out of which answers are to be given for any Three questions;

S.No	Theory & Practicals	Maximum Marks	Minimum Marks
1.	Pathology & Microbiology	100	35
2.	Hematology & Biochemistry	100	35
3.	Health Care Management	100	35
P1	Practicals- Medical Lab Technology	100	35

PAPER-1: PATHOLOGY & MICROBIOLOGY

Unit-1: Cell Injury and Cellular Adaptations.

Normal Cell-Cell Injury- types of cell injury -morphology of cell injury, cellular swelling, autolysis, necrosis, apoptosis & gangrene-Cellular adaptations-atrophy, hypertrophy, hyperplasia & dysplasia-granulomatous inflammation, tuberculoma.

Unit-2: Haemodynamic Disorders

Oedema, hyperemia, congestion, haemorrhage, circulatory disturbances, thrombosis, ischaemia & infarction-Neoplasia:Definition, how does it differ from hyperplasia, difference between benign tumor and malignant tumor- Healing:Definition, different phases of healing, factors influencing wound healing.

Unit-3: Biology of pathogens

Morphology of bacteria- Shape, Capsule, Flagella, Inclusion, Granule, Spore- Growth and Maintenance of Microbes: Batch Culture, Continuous culture, bacterial growth- total count, viable count, bacterial nutrition, oxygen requirement, CO₂ requirement, temperature, pH, light. Simple, Grams staining, Ziehl-Neelsen staining or AFB staining.

Unit-4: Sterilization and Disinfection

Physical agents- Sunlight, Temperature less than 100°C Temperature at 100°C, steam at atmospheric pressure and steam under pressure- irradiation, filtration- Chemical Agents-Alcohol, aldehyde, Dyes, Halogens, Phenols, Ethylene oxide-Culture Media: Definition, uses, basic requirements, classification, Agar, Peptone, Transport Media, Sugar Media, Anaerobic Media, Containers of Media, Forms of Media.

Unit-5: Collection and Transportation of Specimen

General Principles, Containers, Rejection, Samples- Urine, Faeces, Sputum, Pus, Body fluids, Swab, Blood- Disposal laboratory Waste: Non-infectious waste, Infected sharp waste disposal, infected non-sharp waste disposal.

References:

1. Clinical Diagnosis and Management by Laboratory Methods. Todd, Sanford, Davidsohn (2003). 17th edition. Henry, J.B, W.B. Saunders co., New Delhi.
2. A Handbook of Medical Lab Technology guide (Tamil). Kannan, R. New Century Book House (pvt) limited.

Paper-2: HEMATOLOGY & BIOCHEMISTRY

Unit-1: Blood composition

Blood cells-Haemoglobin- Blood groups-Coagulation Factors-Anaemia & Immunoglobulins-blood clotting- immunohematology-Principles for blood banking- Bone Marrow: Cell composition of normal adult Bone marrow-, Aspiration, Indication, Preparation & Staining, Special Stain for Bone Marrow studies.

Unit-2: Hematological Disorders

Classification of Anemia: Morphological & etiological-Iron Deficiency Anemia: Distribution of body Iron, Iron Absorption- causes of iron deficiency, lab findings- Megaloblastic Anemia : Causes, Lab findings- Hemolytic Anemia : Definition, causes, classification & lab findings - Leukemia : Classification, Blood Picture, Differentiation of Blast Cells.

Unit-3: Carbohydrates & lipids

Introduction, definition, classification, biomedical importance & properties. Brief outline of metabolism: Glycogenesis & glycogenolysis -Regulation of blood glucose level- classification, biomedical importance - Fatty acids- Beta oxidation of fatty acids- fatty liver, Ketosis, Cholesterol & its clinical significance-Lipoproteins in the blood composition & their functions Atherosclerosis- Diabetes mellitus – types- gestational diabetes mellitus- glucosetolerance test - glycosurias- Hypoglycemia.

Unit-4: Proteins

Introduction, definition, classification, biomedical importance of proteins-. Metabolism: Urea cycle - metabolic disorders in urea cycle – Creatine - Creatinine – Proteinuria – Protein deficiencies: methods of diagnosis and bio-medical significance.

Unit-5: Enzymes

Introduction, definition & classification- coenzymes, isoenzymes- properties- diagnostic value of serum enzymes - Creatinine kinase, Alkaline phosphatase, Acid phosphatase, LDH, SGOT, SGPT, Amylase & Lipase –Enzyme deficiency disorders.

References:

1. Clinical Diagnosis and Management by Laboratory Methods. Todd, Sanford, Davidsohn (2003). 17th edition. Henry, J.B, W.B. Saunders co., New Delhi.
2. A Handbook of Medical Lab Technology guide (Tamil). Kannan, R. New Century Book House (pvt) limited.

Paper 3: HEALTH CARE MANAGEMENT

Unit-1: Principles of Management

Management an Overview-Defined, Functions of Management, Managerial Roles and responsibilities- Fundamentals of Planning-Objectives, Strategies, Policies, Decision making. Fundamentals of Organizing- Nature and purpose, departmentation, Span of Management, Strategic organizing design, line and staff authority and decentralization.

Unit-2: Health and Disease

Concept & Definitions- Dimensions of health- Determinants of health-Evolution of Public Health- Health indicators- Disease & causation- Natural history of disease- Disease control & prevention- Changing patterns of disease- Disease classification and International Health (WHO &UN)- Community medicine: principles and components.

Unit-3: Health Care Services in India

Evolution of public health systems in India (ancient, colonial & post independence)- Health Planning in India National Health Policies)- Public health systems in India - Evolution and organisation of private health systems in India - Current trends in private health care in India – PHCs & their role.

Unit-4: Global Health Service Systems

Medical sociology– Introduction- Sociological perspective of health, illness and healing- Institutional perspective and Organizational perspective- Introduction to the global health scenario- Health System Models: Full State provision and funding model- NHS Model, Social health insurance model- Minimal State intervention model (examples & case studies)- Health information and management – Principles of telemedicine.

Unit-5: Population Health

Introduction to population studies -Issues of Indian society & culture- Nuptiality & Fertility- Reproductive health: factors- introduction to epidemiology (concept, terms, aims & uses)- epidemiological methods: Epidemiology of communicable diseases (chicken pox, measles, diphtheria, TB, polio & HIV/AIDS) -Epidemiology of Non-communicable diseases (CHD, Cancer, Diabetes & Obesity).

References

1. Park K: 2005. *Text Book of Preventive and Social Medicine*. Banarsidas Bhanot Publishers: Jabalpur. 18th Ed.
2. Goel S L. 2001. *Health Care System and Management: Primary Health Care management*. Deep & Deep Publications: New Delhi. Vol 4
3. Beaglehole R, Bonita R & Kjellstrom T. 1993. *Basic Epidemiology*. WHO: Geneva

Paper-4: PRACTICALS - I MEDICAL LAB TECHNOLOGY

1. Simple & Differential Staining
2. Preparation of swabs/sterile tubes & bottles.
3. Preparation of smear.
4. Identification of common microbes.
5. Blood analysis: differential count, HB testing, ESR
6. Blood collection in humans – types
7. Separation of serum
8. Laboratory testing of carbohydrates & lipids.
9. Identification of Carbohydrates (qualitative tests).
10. Identification of Proteins (qualitative tests).