OPJS UNIVERSITY, CHURU (RAJASTHAN)

SYLLABUS
For
Diploma in
Medical Laboratory Technology (DMLT)

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School of Para-Medical Science
OPJS UNIVERSITY, CHURU (RAJASTHAN)
2014-15

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SCHEME OF EXAMINATIONS
(DMLT)

Duration of Course: 2 Years
Eligibility: 10+2 (PCB)
Lateral Entry: Candidate who has 10+2 + CMLT from a recognized University is eligible for 2nd Year in DMLT.

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(First Year)

(Second Year)

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6 month internship in any Hospital or Nursing Home

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Details of Syllabus

(First Year)

DMLT-011- ANATOMY-I

COURSE CONTENTS – THEORY

(1) Introduction of Bones of the Human Body of :
   - Upper Limb : clavicle, scapula, humerus, radius, ulna, carpus, metacarpus & phalanges
   - Lower Limb : hipbone, femur, tibia, fibula, tarsus, metatarsus & phalanges
   - Skull : name the bone of skull and sutures between them.
   - Thorax : ribs and their articulations
   - Vertebral Column : cervical, thoracic, lumber, sacral and cocasial vertebrae

(2) Surface Markings of the Body :
   - Nine regions of the abdomen
   - Four quadrants of the Hip

(3) Introduction of different Vital Organs :
   (A) Respiratory Organs :
      - Nasopharynx
      - Oropharynx
      - Larynx
      - Trachea
      - Bronchi
• Lungs (and their lobular segments)
• Thoracic cavity
• Pleura and Pleural cavity

(B) Circulatory Organs
• Anatomical position of the heart
• Pericardium of the heart
• Chambers of the heart
• Great vessels of the heart
• Valves of the heart

(C) Digestive Organs:
• Tongue
• Teeth
• Oral cavity
• Pharynx
• Oesophagus
• Stomach
• Small intestine
• Stomach
• Small intestine
• Large intestine and its colons

PRACTICAL :-
Labeled Diagrams of different organs and bones Vivo

DMLT-012- PATHOLOGY-I

COURSE CONTENTS –
1. The Cell in health and disease
   a. Introduction of pathology
   b. Cellular structure and metabolism
   c. Inflammation – Acute and Chronic
   d. Derangement of Body Fluids and Electrolytes
      • Types of shocks
      • Ischaemia
      • Infection
   e. Neoplasia – Etiology and Pathogenesis
2. Introduction of hematology
   a. Formation of Blood
   b. Erythropoiesis
   c. Leucopoiesis
   d. Thrombopoiesis
   e. Collection of Blood
   f. Anticoagulants
   g. Red cell count – Haemocytometer, Methods and Calculation
   h. WBC Count – Methods
i. Differential Leucocytes Count (DLC) –
   Morphology of White Cells, Normal Values
   Rananocostry Stains: Staining procedures
   Counting Methods, Principle of staining
j. Hb estimation - Method
   Colorimetric Method
   Chemical Method
   Gasmetric Method
S. G. Method  Clinical Importance

I. Hematology:
   • ESR
   • Methods
   • Factors – Affecting ESR
   • Normal Values
   • Importance
   • RBC – Indices
   • Platelets

II. Body Fluids:
   (a) Urine:
      • Method of Collection
      • Normal Constituents
      • Physical Examination
      • Chemical Examination
   (b) Stool Examination:
      • Method of Collection
      • Normal Constituents and appearance
      • Abnormal Constituents (Ova, Cyst)
   (c) C.S.F. Examination
      • Physical Examination
      • Chemical Examination
      • Microscopy
      • Cell Count
      • Staining
   (d) Semen Analysis
      • Collection
      • Examination
      • Special Tests

Practical:
I.
   • Collection of Sample
   • Hb estimation
   • TLC and DLC
   • RBC Count
• Peripheral blood film – staining and study of Malarial Parasite
II. Laboratory management – Sample Collection, Labeling, Transport, Screening, Reporting and Dispatch of Reports. (a) Urinek, Stool, Semen and C.S.F. – Collection, Handling, Examinations  
(b) Absolute Eosinophil Count, PCV, RBC indices, ESR Estimation, Platelet Count

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DMLT-013- BIOCHEMISTRY-I

COURSE CONTENTS:
1. Introduction of Biochemistry
2. Elementary knowledge of inorganic chemistry: - Atomic weight, molecular weight, equivalent weight, acid, bases.
3. Definition and preparation of solutions: - Percent solution, Molar solution, Normal solution and Buffer Solution etc.
4. Definition and preparation of Regent.
5. Unit of measurement
6. Elementary knowledge of organic chemistry
   • Organic compounds
   • Aliphatic and Aromatic
   • Alcohols, Aldehydes, Ketones, Amines, Esters, Phenol etc.
7. pH indicators: pH paper, universal and other indicators, pH measurement: different methods.
1. Lipids: -
   • Introduction and functions
   • Classification
   • Steroids
   • Metabolism
   • Estimation: Total lipids, HDL, LDL, VLDL, Total cholesterol, Triglyceride
   • Clinical significance
2. Principal of Assay procedures for biological material and estimation of kidney function tests.
   • Urea
   • Uric acid
   • Creatinine
3. Electrolytes:
   • Function
   • Properties
   • Estimation of Essential electrolytes: Sodium, potassium, calcium, chloride and phosphorus etc.
   • Clinical Importance
4. Genetics
   • DNA, RNA Structure
   • Gene coding
   • Transcription & Translation
Practical

Introduction and usage of Glassware and Instruments

Glassware:
• Composition of Glass
• General glass wares

Instruments:
• Balance
• Hot plate and Magnetic stirrer
• Centrifuges
• Incubators
• Constant temperature bath
• Colorimeter: Principal, Function
• Photometer
• Flame Photometry

DMLT-014- MICROBIOLOGY-I

COURSE CONTENTS:

I. Introduction and brief history of Microbiology
• Historical Aspect
• Relationship of Micro-organism to men
• Micro-organism in Disease and Health

II. Requirement and uses of common Laboratory Equipments
• Incubator, Hot Air Oven, Water Bath
• Anaerobic Jar, Centrifuge, Autoclave
• Microscope
• Glassware – Description of Glassware, its use, handling and care

III. Sterilization:
• Definition
• Classification and General Principle of Sterilization
• Autoclave – its structure, functioning, control and indicator

IV. Antiseptics & Disinfectants
• Definition
• Types
• Mode of Action
• Uses

V. Collection, Transportation and processing of clinical samples for Microbiological investigations

Bacteiology
• Definition
• Bacteria – General characteristics of Bacteria
• Classification and morphology of Bacteria
• Structure of Cell, Capsule, Flagella, and Spore
• Growth of Bacteria
• Nutrition of Bacteria

Virology:
• Definition
• General Introduction of Virus
• Physiochemical characteristic of Viruses
• Diseases caused by different Virus and mode of infection

Parasitology:
• Definition
• General characteristics of Parasite
• Classification of Parasite
• Mode of transmission

Fungus
• Definition
• Structure
• Classification

Practical:
Demonstration of washing of instruments

DMLT-015- PHYSIOLOGY-I

COURSE CONTENTS
1. Cell:
• Definition
• Structure and functions the cytoplasmic Organelles
• Reproduction: Miosis, Mitosis

2. The important physico-chemical laws applied to physiology
• Diffusion
• Osmosis
• Bonding
• Filtration
• Dialysis
• Surface Tension
• Adsorption
• Colloid

3. Fundamentals of different Organ Systems
• Cardiovascular System
• Respiratory System
• Digestive System
• Excretory System
• Reproduction System
• Endocrine System
• Lymphatic System
• Pracitcal
1. Corresponding : (Official, Business And Personal)
   One Letter from each category (Official, Business and Personal) may be set in the examination paper and the students be asked to write one of them.

2. Grammar
   A brief review of easy form of tenses. Conversion of direct narration into indirect form of narration and vice versa (only simple sentences). Punctuation.

3. Essay
   Preferably on scientific topic from the given outlines. The paper setter may be instructed to give a choice of attempting one out of three topics. The question paper may provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following.
   (i) Science
   (ii) Technology
   (iii) General.

COURSE CONTENTS

(A) Reproductive Organs :
   • Male and Female Conads : Testes, Epididymis, Ovary, Fallopian Tube, Uterus, Vagine etc.
   • Introduction of male Genital Organs
   • Introduction of female Genital Organs

(B) Liver and Spleen :
   • Introduction
   • Anatomical position
   • Gal bladder

(C) Excretory Organs :
   • Cortex and medulla of Kidney
   • Ureter
   • Urinary Bladder
   • Urethra (male and female)

(D) Muscles :
   • Introduction, Origin and Insertion, Function

PRACTICAL
DMLT-022- PATHOLOGY-II

COURSE CONTENTS
(a) Human blood group antigens and antibodies
(b) ABO Blood group systems
   • Sub. – group
   • Source of antigens and types of antibodies
(c) Rh Blood group System
   • Types of Antigen
   • Mode of Inheritance
   • Types of Antibodies
(d) Other Blood grup Antigens
(e) Blood Collection
   • Selection and screening of donor
   • Collection of blood
   • Various anticoagulants
   • Storage of Blood.
   • Changes in Blood on Storage

PRACTICAL :
Blood grouping
Tube Method
Slide Method

DMLT-023- BIOCEMISTRY-II

COURSE CONTENTS
1. Aim and Scope of Biochemistry
2. Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation and siposal of Biological material.
3. Chemical examination of urine : Qualitative, Sugar, Protein, Bile Salt, Bile Pigment, Ketones Bodies
4. chemical examination of Stool : Occult Blood.
5. Chemical examination of other Body Fluids : CSR, Plural Fluid, Ascitic Fluid etc.
6. Laboratory management and Maintenance of Records.
7. Carbohydrates : -
   • Introduction
   • Importance
   • Classification
   • Properties
   • Estimation of Glucose
   • Clinical Significance
8. Protein : -
• Introduction and Physiological importance
• Amino acids
• Essential amino acids
• Classification
• Denaturation of Proteins
• Estimation of Total protein, Albumin, Globilin, A/G Ration
9. Introduction, Properties and function of important hormones
10. Enzymes and Co-enzymes
• Introduction and difference
• Functions
• Estimation of important enzymes
  (i) SGOT (AST)
  (ii) SGPT (ALT)
  (iii) Alkalline Phosphatase
  (iv) Acid Phosphatase
  (v) Amylase, lactate dehydrogenase.
  (vi) CPK, CPK-MB

PRACTICAL:
Method of estimation of glucose : Benedicts Reaction, Glucose oxidase Method
Method of estimation of Protein, Albumin.

DMLT-024- MICROBIOLOGY-II

COURSE CONTENTS
Staining of Bacteria :
1. Composition and preparation of Staining
2. Principle and Procedure of Bacteriological stain
• Gram’s Stain
• Ziehl-Neelsen Stain
• Albert Stain
• Spore and Negative Stain

Cultivation of Micro-organism :
• Introduction and uses of culture
• Classification of culture media
• Composition of common of Laboratory culture media
• Special media and preparations
• Techniques of inoculation and isolation
• Antimicrobial sensitivity
• Anaerobic cultivation techniques

Isolation of Viruses in Laboratory by tissue culture
• Cell and tissue culture technology
• Embryonated Egg
• Principles of animal cell culture and their use in Virology

Different staining techniques used in Virology
Principle of different serological test used in Virology
Mode of Transmission of Viral agents
Prevention of Viral disease
Immunity in Viral infection

PRACTICAL
1. Staining : ZN Staining of M. T. B. and M. Lepra, Albert Staining
2. Culture
   • Type of Media
   • Preparation
   • Inoculation
   • Colony Characteristic
   • Staining and Antibiotic Sensitivity

DMLT-025- PHYSIOLOGY-II

COURSE CONTENTS
1. Blood
   • Definition
   • Composition
   • Function
2. Formation of different type of blood Cells
   • Erythrocytes
   • Leucocytes
   • Thrombocytes
3. Mechanism of Blood Clotting
4. Cerebrospinal Fluid
   • Formation
   • Composition
   • Function
5. Special Senses
   • Hearing
   • Taste
   • Smell
   • Touch
   • Sight

PRACTICAL :
Viva and diagrams of Corpuscles

DMLT-026- COMMUNICATION SKILLS-II

SECTION A

1. Precis and Comprehension
Precis writing of simple passages from the prescribed text book. The passage selected should be from the textbook. The passage selected should be such as easily lends to surrounding. The passage should be of 100 to 150 words. In order to test comprehension a few questions on the passage may be set.

SECTION B

2. Communication Techniques
   Importance of communication
   One way and two way communication
   Essentials of good communication
   Methods of communication, oral, written and non-verbal
   Barriers to communication
   Techniques of overcoming barriers
   Concept of effective communication
   All forms of written communications including drafting reports, notices, agenda notes, business correspondences, preparation of summaries and précis, telegrams, circulars, representations. Press release and advertisements
   Telephonic communications

SECTION C

4. Technical Report Writing
   Technical report writing from the given outlines, a choice to attempt one out three to be given in the examination. The question paper shall provide the required outlines

SECTION D

5. Equivalent Terminology
   150 popular administrative and technical terms in English with their equivalent words in regional language or in Hindi. These terms shall be officially prescribed and sent to the paper as well. Practice of writing personal resume and writing application for job/employment

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