



DRIT 2nd year

DIPLOMA IN X-RAY TECHNOLOGY

Anatomy & Physiology

1. **Introduction:-** Definition- Anatomy, Physiology ,Basic medical terminology(Body cavities, planes, general organization of the body).
2. **Cell & Tissue:-** Basic organization of cell- Mitochondria, Golgibody, Ribosomes, Endoplasmic reticulum, Nucleus, Tissues , Types of tissues and their functions.
3. **Skeletal system:-** Classification of Bones, Upper extremity, Lower extremity, Vertebral column, Skull Bones, Ribs Synovial joints, Joint diseases.
4. **Cardiovascular System-** Blood, Heart(Structure and functions), Cardiac Cycle, Cardiac output, Blood pressure, Heart sound, Blood Vessels, Circulation (Pulmonary & Systemic)
5. **Respiratory System:-** Nose, Pharynx, Larynx Trachea, Bronchi, Lungs, Function of Respiratory tract, tidal volume, residual volume, Reserve Volume.
6. **Digestive System:-** Mouth, Oesophagus, Salivary glands, Stomach, Small Intestine, Large Intestine, Pancreas, Liver, Biliary system, General Principle of Digestion.
7. **Excretory System:-** Kidney, Function & internal Structure and formation of Urine, ,Nephron- Structure and functions, Ureter, Urinary Bladder, Urethra, Micturation.
8. **Reproductive System:-** i) Male reproductive System- Testes, Scrotum, penis, glands
ii) Female reproductive System- Ovaries, Fallopian tubes, Vagina, Breast , Female reproductive cycle , Menstruation , Fertilization.
9. **Endocrine glands:-**Types of glands, Types of endocrine glands, Pituitary gland, Pineal gland, Thyroid gland, Adrenal gland, Parathyroid gland, Pancreas, Gonads.
10. **Nervous System:-** Nerve cell structure and function, Central nervous system, Peripheral nervous system, Automatic nervous system, Brain-parts and functions, Function of CSF, spinal cord, nerves.



11. Integumentary system- Skin(Introduction, Structure, Function), hair, nails, exocrine glands.

12. Lymphatic System:- Introduction, Structure Function, location, spleen

Radiographic Photographic Techniques

Theory

Upper Limb:

- Finger ,wrist, elbow, arm, forearm.

Shoulder joint:

Lower Limb:

- Toes-foot- calcaneum - ankle joint-,leg, knees- patella, femur.

Hip & Pelvis:

- Hip-neck of femur, pelvis sacro iliac joints.

Vertebral column:

Spine- thoracic, lumbar spine- lumbo-sacral spine, sacrum coccyx, Flexion and extension Bones and the Throat:

- Sternum- Ribs, clavicles.

Skull:

- Land marks, planes- cranium- facial bones, maxilla Mandible- Zygomatic – T.M. Joints, bones- Optic foramen— P.N.S. ,base of skull, Orbits

Chest:

Chest AP, PA, Oblique, portable, Erect and decubits view & apicogram.

Abdomen:

- Preparation, indication and contra- indication acute abdomen , abdomen supine and erect decubitus study.

Soft tissue radiography:

- Neck & Breast etc.

Dental radiography:

- Dental X-ray of maxillary and mandibular teeth, occlusal- view of maxilla, maddible and nasal Bones.

Practical

Taking X-ray of all the parts of the human body as the theory syllabus



Radiotherapy

General pathology in radiation therapy:

Pathology:

- Definition, cell growth – cell deformities – cell damage- defence mechanism cell repair.

Neoplasia:

- Benign & malignant including its mode of growth and metastasis.

Causes of Disease:

- Congenital – traumatic- metabolic and deficiency – infection (micro- organism) immunization.

Bloods diseases:

- Leukaemias, Anaemias

Radiotherapy:

- Radiation treatment- methods – external radiation, use and application of radiation

Radiotherapy techniques for:

- Skin disease , Disease in system: respiratory, alimentary, urinary, reproductive .

Radiation Biology

- Harmful effects of radiation
- X-ray interaction with tissue
- Radiation effects on DNA
- Radiation effects in utero
- Ten day rule
- Protection in Radiotherapy
- Biological effects- Stochastic effects and genetic effects.
- Radiation monitoring devices.

Radiography Special Procedures

- Contrast Media
- Emergencies in radiology department
- Urinary tract: I.V.P. Retrograde pyelography- Cystourthrography
- Biliary tract:
- T-tube cholangiography. E.R.C.P.
- Gastrointestinal tract:
 - Ba.. swallow- Ba.. meal, upper GIT Ba. Meal following through B.a enema. Ba double contrast
- Female genital tract:



- Hystero salpingography
- Angiography:
- CNS:
 - Myelography
- **Computed Tomography:**
 - Principal, Equipment, Generation and Imaging
- **Ultrasound Scanning**
- Principles
- Display of Images, Modes
- Doppler Ultrasound

- **Magnetic Resonance Imaging –**
- Patient Preparation and Position Principles
- Equipment
- MR Signal
- Image Characteristics
- Advantage & Precautions

Electrocardiography

Theory

• Introduction to Electrocardiography; History; psychological basis of E.C.G; conduction Velocity;
Electrophysiology Central terminal of Wilson; augmentation, Esophagus leads, Pathway of Activation ; Vector Concept
Normal Electrogram:
• Atrial complex ; P-R interval; QRS Complex; S.T Segment; T-Wave; U-Wave; Q-T interval;
Electrical Axis; Heart Position; Interpretation of an ECG; How to record and ECG etc.
Abnormal Electrocardiogram:
• Abnormal P-Wave Interventricular Conduction Defects, RBBB, LBBB, Incomplete LBBB, LAHB, LPPHB; Non-specific Interventricular Conduction Defects, Bilateral Bundle, Branch Block,
Trifascicular Blocks WPW Syndrome; Lawn-ganong-Levine Syndrome; Mahim by Pass; Hypertrophy; Right Ventricular Hypertrophy (RVH); Pulmonary embolism; Chronic Obstructive lung Disease (COLD), Biventricular Hypertrophy; Overload Concept; Diastolic Overload (volume overload) etc.



Coronary artery disease:

- Ischaemic Injury, infraction, subtle, atypical, non-specific Patterns: ocnductoin defecs and infraction; localisation of infraction: vpm and acute myocardial infraction; artial infraction; VCG in myocardial infraction; atrial infraction; VCG in myocardial infraction, coronary insufficiency etc.

Exercise test:

- Type of exercise test ; termination exercise; exercise protocols in treadmill testing; escalation of exercise test results; preparation of patient for exercise testing etc.

Drugs and electrolytes:

- Digitalis; potassium; Hypokalaemia; calcium; quinidine effect; phenothiazines; Anthracylines; cerebrovascular accidents; hypothermia; pericarditis ; myocarditis; neuromuscular diseases; heart trauma; malignancy involving heart; electrical alternans; negative U0vaves; liquid protein diet; anaemia etc;

Disorders of cardiac rhythm:

- Disturbance of impulse formation; disturbance of impulse conduction; secondary disorders of rhythm; physiology of cardiac rhythm; Automaticity; conductivity; A-V nodes; sinus rhythm; sinus tachycardia; sinus bradycardia; sinus arrhythmia; sino atrial block; partial Sa block; complete SA block; causes of Exit block; atrial extra systoles; Blocked atrial premature beats; cause of Atrial tachycardia (PAT); Chaotic Atrial Rhythm; Atrial flutter; Atrial fibrillation; Supraventricular tachycardia (SVT); ventricular rhythm; ventricular tachy-cardia (VT) ventricular fibrillation; paraarrhythmias; parasystole; group beating ; AV-Disoocation; torsade de points ; sick sinus syndrome etc.

ECG as a clue to clinical diagnosis:

- Pulmonary stenosis tricuspid atresia ; atrial spetal defect; ventricular septal defect; Ebstein anomaly; corrected transportation of great vessel; mirror image dextrocardia ; anomalous brig in of left coronary artery; Rheumatic fever: mitral value prolapse; athletes heart; cardiac pacing etc.

Practical:

Use of electro-cardiogram machine and recording etc as per the syllabus