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Syllabus for Two Years Diploma Course in X-ray Technician

FIRST YEAR

ANATOMY

SECTION - I

1. Histology - Cell, tissue of the body, epithelium, connective tissue, cartilage, bone. lymph. muscle, Nerve.
2. Osteology - Formation, Function, growth & repair of bones.
3. Embryology - Ovum, Spermatozoas fertilization. differentiation, development of various systems.
4. Blood Vascular system - Arteries. Capillaries, Veins, heart, Lymphatic system.
5. The Respiratory system - Anatomy of Larynx. 'Trachea and Bronchi, pleura, lungs.
6. The digestive system.
7. The urogenital system.
8. Surface Anatomy.

SECTION - II

Anatomy, Microscopic and gross study of:

1. Peripheral Nerves	2. Neuromuscular Function	3. Sensory end Organs.
4. Spinal Cord - segment & Areas	5. Brainstem	6. Cerebellum
7 Inferior Colliculi	8. Superior' CoUiculi	9. Diencephalon
10. Hypothalamus.	11. Epithaiamus	12. Thalamus
13 - Cerebral Hemispheres	14. Corpus Straitum	15. Rhinencephalon
16. Lateral Ventricles	17. Meninges	18. Blood supply of the brain
19. Internal capsule	20. Visual radiation	21. Auditory radiation
22. Lamocortical radiations system	23. Pyramidal system	24. Extra pyramidal
25. Anatomic integration	26. lntra— cortical inte gration	

SECTION - III

1. Fascias and muscles of head, neck & face.
2. Fascias and muscles of trunk.

4. Fascias and muscles of lower limb.
5. Classification of joints.
6. movements of Joints.
7. 1' actors permitting and limiting movements.
8. Joints of head & Neck.

10. Joints of Upper limb.
11. Joints of lower Limb.

Surface Anatomy:..

1. To study the surface land marks on human body.
2. To study the muscle of trunk, lower and upper extremities and face on a dissected human both.
3. To study the Bones of Human body with special emphasis on origin and insertion, land mark
4. To study the anatomy' of joints of upper and lower - extremities and vertebral column on a dissected - human body.
5. To study the anatomy of C. N. S. and P. N. S. on a dissected human body.
6. To study the Anatomy of Respiratory, Digestive, Urinary and Genital system on a body.

PHYSIOLOGY

SECTION-I

1. The Cell Function
2. **Cell** Membrane.
3. Digestion – Control of food & water intake and s ecretion, movements of the alimentary canal. Circulation – Cardio – vaarculat system, mec hanical and electro physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeletal muscle.
4. Blood and lymph – cell renewal system, haemoglob in, Erythocyte, granulocyte, Lymphocyte, coagulation, regulation of hydrogen withing concentration of body fluid, fluid distribution and exchange.
5. Renal Function.
6. Respiration - respiratory gases, pulmonary gas exchange. control and mechanics of breathing hypoxia. disposal, oxygen therapy and resuscitation.
7. Endocrine systems - pituitary gland, thyroid, parathyroid, adrenal glands. gonads.

SECTION - **II**

Neuro - Physiology and muscle mechanism:
I Cell membrane – Ionic and potential gradients and transport 2. Action potential.
3 Special Properties of nerve, trunk and tracts.
4. Muscle - contraction, mechanism. chemistry and biophysics.
5. Motor Units.
6. Reflex physiology,
7. Synapes.
8. Supraspinal Control.

10. Cerabellum and bassal ganglia.
11. Autonomic nervous System.
12. Somatic sensation.
13. Pam.
14. Taste, Olfaction and visceral sensations.
I5. Auditory system.
16. Vision.
1 7. Neuro Physiological Physiology.

SECTION - III

Physiology of **Exercise** and Work:
1. Neuromuscular activity, human movement, Physiological mechanism in movement behaviour skill strength, endurance, analysis of movement.
2. Circulatory and respirator response to exercise and work of the heart, blood circulation, body fluid changes, pulmonary ventilation, gas exchange and transport.
3. Effects of exercise and work of the body function.
4. Metabolic and environmental aspects of exercise and work - Metabolism, energy requirement. efficiency of muscular work, nutritional aspects. heat and body temperature. environmental factors.
5. Fatigue and training - endurance fatigue and recovery training.
6. Fitness and Health, Age, Sex, Body type and race stress, medical aspects of exercise.

RADIO PHYSICS

1. Simplified Arithmetics: - Decimals, Algebra, Chemistry, Graphs and Chart, Large and Small numbers.
2. Physics and the Units of measurement.
3. Physical concept of energy: - Force, Work, Energy.
4. Matter the co - open substance: - Subdivisions of matter, Atomic number, Mass number, Chemical behavior, lonisation.
5. Fatigue and health - endurance, fatigue and recovery training.
6. Fitness and health - age, sex, body type and race stress medical aspects of exercise.
7. The Electric current: - definition, The nature of an electric sources of current electricity, The factors in the simple batteries or cell. Elementary electric circuits current. -
8. Magnetism: - Definition, 'Classification of magnets. Magnetic fields, Classified materials Nature of magnetism, Magnetic conduction, Ability of magnets, Characteristics of iones of force.
9. Electromagnetism: - Definition, Electromagnetic phenomena electromagnetic induction Direction of induced electric current, self-induction, Meter.
10. Electric Generator and Motors: - Electric generator, properties of alternating current circuits Direct Current generator, Advantages of alternating current, Electric motors, Definition and principle of a motor The implements of motors. Tubes of electric motors, Current measuring devices.
11. Production and control of High Voltage: - Transformer, Construction of Transformer. Transformer loss, Voltage Control, Autotransformer system.
12. Rectification: - Definition, Methods of rectifying all Currents.

RADIOLOGY - I
SECTION 1

1. Radio activity and Radium: - Unstable atoms, Radioactive series Radio Properties. Radio Active radiation, The _radium series, Half-life.
2. Radio Dosage: - Types of applicators. Filtrati Qn, containers, Protection, Losses radioactive -topes.
3. Artificial Radioactivity: - Detmnition, Isotopes in imaging.

SECTION - II

1. X Ray [Roentgen Rays]: How X - Ray are discovered, what are X – Ray Sources Roentgen of X - Rays consideration of production.
2 Roentgen Rays: - Target materials, properties of Roentgen rays, Quality

radiation, hard and soft X Rays.
3. Respiratory system, X - Ray of chest, trauma and its disease.
4. CVS - **X** - Ray of chest AP & Lateral view to see heart,
5. GI - **X** - Ray of plain abdomen Ba swallow of esophagus, Ba Meal of Stomach & Duoden Ba Meal esophagus ileo caecal junction, Ba. Enema. Hiatus Hernia
6. The interaction of penetrating radiation and matter.
7. Detection of Rays. Roentgen ray dosage.
8. Modern X - Ray Tubes: - General X - Ray tubes, Glass envelope, Cathode, Anode, situation Current. Tube rating charts, Rornyhrn, Valve tubes, Principles of operation.
9. X -Ray circuits: - source electricity. X - Ray circuits, coplefed with diagem.
10. X- Ray control panel.
11. Protection in Radiography: - 'The permissible dose, protection from whole body exposure Protection from local exposures. Protection of the patient from Radiation, Electric Protection. Hygienic considerations.
12. General- S

DARK ROOM TECHNIQUE - I

1. The Dark Room: - Location of the dark room. Building essentials. Entrance, Ventilation, apparatus and equipments for dark room. Construction.
2. X - Ray films, Film holders and Intensifying screens: - Composition of film, types of Films. suggestions in handling unexposed films, sure holders and intensifying screens. Intensifying screens. Fluroscope.
3. Chemistry of Radiography: - Theoretical concepts of the Roentgenogram.
4. Film Processing: - Development, Finishing. Fixation. Washing, Drying. Storing Processing technique.
5, Dark Room Frrors.
6. Types of universal X - Ray Films. Non screen films, dental X - Ray turn. Handing of X - Ray films.