X - RAY

DEPARTMENT OF HEALTH, MEDICAL EDUCATION, & INDIGENOUS MEDICINE I GOVERNMENT OF BIHAR, PATNA.

COURSE/CURRICULAM FOR 2 YEARS DIPLOMA COURSE IN X-RAY TECHNICIAN.

First Year

THEORY				
Sl. No.	Subject		Full Marks	Pass Marks
1.	Applied Anatomy & Physiology		100	50
2.	Radio Physics Pertaining to Radiology		100	50
	Total Theory Marks		**200**	**100**
PRACTICAL				
3.	A.	Practical	100	50
	B.	Viva	40	20
	Total Practical Marks		**140**	**70**

Second Year

THEORY				
Sl. No.	Subject		Full Marks	Pass Marks
1.	Discovery & Production		100	50
2.	Dark room techniques and Requirement		100	50
	Total Theory Marks		**200**	**100**
PRACTICAL				
3.	A.	Practical	100	50
	B.	Viva	40	20
	Total Practical Marks		**140**	**70**

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, Lymphane 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
23. Pyramidal system
24. Extra – pyramidal system
25. Anatomic integration
26. Intra - cortical integration

SECTION – III

1. Fascias and muscles of head, neck & face.
2. Fascias and muscles of trunk.
3. Fascias and muscles of upper limb.
4. Fascias and muscles of lower limb.
5. Classification of joints.
6. Movements of joints.
7. Factors Permitting and limiting movements.
8. Joints of head & Neck.
9. Joints of Tunks.
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 body.
3. To study the Bones of Human body with special emphasis on origin and insertion, land mark of muscles.
4. To study the anatomy of joint 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 dissected human body.

PHYSIOLOGY

SECTION – I

1. The Cell Function.
2. Cell Membrane.
3. Digestion – Control of food & water intake and secretion, movements of the alimentary canal Circulation - Cardio – vaarculat system, mechanical and electro Physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeleral muscle.
4. Blood and lymph – cell renewal system, haemoglobin, Erythocyte, granuloeyle, lymphocyte, coagulation, regulation of hydrogen within concentration of body fluid, fluid distribution and exchange.
5. Renal Function.
6. Respiration – respiratory gases. Pulmonary gas exchange, control and mechanics of breathing. Hypoxia, asphyxia, dyspnoea, oxygen therapy and resuscitation.
7. Endocrine systems – pituitary gland, thyroid, parathyroid, adrenal glands, gonands.

SECTION – II

Neuro – Physiology and muscle mechanism:

1. Cell membrane - lonic 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.
9. Cortical Control.
10. Cerabellum and bassal ganglia.
11. Autonomic nervous System.
12. Somatic sensation.
13. Pain.
14. Taste, Olfaction and visceral sensations.
15. Auditory system.
16. Vision.
17. 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, Graphy 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, Ionisation.
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 Transformers, Transformer loss, Voltage Control, Autotransformer system.
12. Rectification:- Definition, Methods of rectifying all Currents.

RADIOLOGY – I

SECTION – I

1. Radio activity and Radium: - Unstable atouis, Radioactive series Radio Properties, Radip Active radiation, The radium series, Halflife.
2. Radio Dosage:- Types of applicators, Filtratiqn, containers, Protection, Losses radioactive Isotopes.
3. Artificial Radioactivity:- Definition, Isotopes in imaging.

SECTION – II

1. X – Ray [Roentgen Rays] :- How X –Ray are discovered, what are X – Ray Sources of Roentgen of X – Rays consideration of production.
2. Roentgen Rays:- Target materials, properties of Roentgen rays, Quality of Roentgen rays, radiation, Hard and soft X – Rays.
3. Respiratory system, X – Ray of chest, trauma and its disease.
4. CVS – X – Rays of chest, AP & Lateral view to see heart.
5. GI – X – Rays of plain abdomen Ba swallow of esophagus, Ba Meal of Stomach & Duodenum, Ba Meal esophagus ileo caecal junction, Ba. Enema, Hiatus Hernia
6. The interaction of penetrating radiation matter.