

Syllabus for the Post of X-Ray Technician

(Preliminary MCQs Based Written Exam)

Examination Scheme

Test Component	Number of Questions	Maximum Marks
Basic Medical Sciences and Radiation Physics	40	40
Radiographic Procedures and Imaging Technology	50	50
General Awareness, Hospital Practice, Ethics and Computer Knowledge	10	10
Total	100	100

Nature of Examination

- Objective Type Multiple Choice Questions (MCQs)

Standard of Examination

- B.Sc. in Radiography level

Medium of Examination

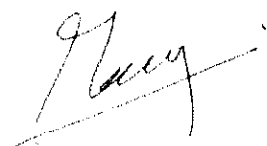
- English and Hindi wherever applicable

Detailed Syllabus

Section I: Basic Medical Sciences and Radiation Physics: 40 Marks

Topic	Subtopics
Human Anatomy and Physiology	General anatomical terms, body planes and positions, musculoskeletal system, cardiovascular system, respiratory system, nervous system, digestive system, urinary and reproductive systems, endocrine glands and hormones, blood, lymphatic system and metabolism
Basic Pathology	Inflammation and healing, degeneration and cell injury, hemorrhage, infarction and ischemia, benign and malignant tumors, infections and immunity, common pathological conditions affecting different systems
Radiation Physics	History and production of X-rays, X-ray tube construction and working, properties of X-rays and electromagnetic radiation, kVp, mA, mAs and exposure factors, image quality, interaction of radiation with matter
Radiation Protection and Safety	Radioactivity and radiation units, dosimetry and radiation detectors, biological effects of radiation, radiation protection principles, ALARA, shielding, time and distance, AERB and BARC safety guidelines
General Microbiology and Infection Control	Sterilization and disinfection, infection control practices, biomedical waste management, universal precautions, basic hospital safety measures

Section II: Radiographic Procedures and Imaging Technology: 50 Marks



Topic	Subtopics
X-Ray Equipment and Dark Room Techniques	X-ray generators and circuits, automatic exposure control, fluoroscopy and image intensifiers, grids, cassettes and intensifying screens, dark room planning and maintenance, film processing, developers, fixers and film storage, film artifacts and fog, mobile radiography equipment
Radiographic Positioning and Techniques	Skull and sinus radiography, upper and lower limb radiography, chest and abdominal radiography, pelvis, hip and spine radiography, dental radiography and orthopantomography, trauma radiography, pediatric radiography, special projections and positioning
Digital Radiography and PACS	Computed radiography (CR) and digital radiography (DR), PACS and DICOM systems, digital image processing, image storage, retrieval and reporting workflow
CT Scan Techniques	Basic principles of CT, CT scanner components and generations, image reconstruction and Hounsfield units, contrast media in CT, CT imaging of brain, chest and abdomen, HRCT and CT angiography, artifacts and dose considerations
MRI Techniques	Basic MRI physics and magnetism, T1 and T2 weighted images, MRI coils and sequences, MRI contrast agents, MRI of brain, spine and joints, MR angiography and MRCP, MRI safety and shielding
Ultrasound and Doppler	Basic ultrasound physics, transducers and image formation, abdominal and obstetric ultrasound, color Doppler principles, use of Doppler in vascular and non-vascular conditions, PNDT Act objectives and guidelines
Mammography and Special Imaging	Mammography equipment and techniques, breast positioning and screening, BIRADS classification, contrast radiography techniques, barium studies and urography

Section III: General Awareness, Hospital Practice, Ethics and Computer Knowledge: 10 Marks

Topic	Subtopics
General Awareness	Current affairs, government health schemes, national programs, basic general knowledge
Hospital Practice and Patient Care	Hospital organization and departmental procedures, patient handling and communication, preparation of patients for radiological procedures, first aid and emergency care, contrast media reactions and management
Professional Ethics and Medico-legal Aspects	Sterilization and infection control, confidentiality, informed consent, medico-legal aspects, professional conduct and ethics
Computer Fundamentals	MS Office, digital records, internet and email usage, basic computer applications in radiology departments

