

**Government of Jammu and Kashmir**

**J&K Services Selection Board**

 **(www.jkssb.nic.in)**

 **Annexure “A” Max time:-150**

 **Time:-2.30 Hours**

**Syllabus for written test (Objective Type) for the posts of Jr X-Ray Tech / X-RAY Tech.**

**1)ANOTMY AND PHYSIOLOGY 20 Marks**

**GENERAL:**

1. Introduction to the Human body. Terms used in Anatomy, (Surface anatomy, markings and locations of different body parts and important body planes.
2. Planes and Regions of Thoracic, Abdominal and pelvic Cavities.

**Cardiovascular System.**

Heart, pericardium, Arterial system, Venous system, Capilary, systemic circulation.

 **Digestive System:**

 Mouth , oesophagus, stomach, small intestine, large intestine, spleen, liver, Salivary Gland , Gall Bladder, pancreas, Physiology and Digestion Absorption and Assimilation of Food.

**Respiratory System:**

Noise , pharynx, larynx, trachea, Bronchi, lungs, pleura, physiology of Respiration-Expiration and Ins;piration, Internal and External Respiration, Breathing control, vital capacity . Tidal volume and Dead space.

**Reproductive system:**

1. Male Reproductive system: Male Reprodutive organs, Spermatogenesis, Testosterone and Secondary sexual characters.
2. Female Reproductive System: Vulva, internal reproductive organs menstrual cycle, ovarian hormones & Female breast.

**Excretory System:**

Introduction to Excretory body organs, structure of kidneys , ureters, Urinary, Bladder, Urethra, Physiology of filteration Reabsorption and secretion.

**Nervous System:**

Brain Meninges , ventricles spinal cord nerves and cerobro spinal fluids.

**Endocrine system –**

Definition, Pituitary Gland, Pineal gland.Thymus Gland Adreneal Glands Thyroid, Parathyroid Glands.

**Sense Organs-**

Structure and function of Eye , Skin , Ear and Tongue.

**Musculoskeletal System-**

Skull, vertebral column, shoulder girdle, Thoracic cage. Bones upper limbs , Bones of lower limbs, type of bony joints and movements.

**2)Transformers- 20 Marks**

Principles construction of step up & down and Auto transformers, construction of high tension .Transformers rectification . Self rectification.

**X-Ray**

Production of x-ray, properties, interaction with matter (Photo electric comption effect and pair production) luminescent effect, photographc effect, ionizing effect & biological effects.

**Units and Measurements of X-Rays-**

Lonixation, Roentigen, Rad Rem, R.B.E. Radiaton badges, lionization chambers.

**x-Ray Tube-**

Construction of x-ray tube Targets, cooling and insulation , x-ray circuits, timers and rectifiers in x-ray, circuits, inter locking circuits, stationary and Ratatory anode tube.

Quantity and Quality x-ray , H.V.T or VVL linear absorption co-efficient grids, cones cylinders, filters, focal spot size LBD FFD or LSD and OFD

Fluoroscopy and Image intensifier

**3)Radiographic photography Techniques- 30 Marks**

**(Dark room Techniques)**

**Dark Room-**

Definition and location of dark room, ideal design of dark room , light and radiation protection devices , safe light test, ventilation, dry and wet benches, Duplicator.

**Radiographic Films-**

Ortho-chromatic films , panchromatic films, Base, Bonding layer, emulsion and super coating of films. Non screen films CTA base and polyster base films. The structure of Double coated & single coated film.

**X-Ray Cassettes-**

Construction of various cassettes, cassettes care, mounting of intensifying screen in cassettes.

**Intensifying screens-**

Luminescence (Phosphores cence and fluorescence) construction of screens. Type of phosphors and pigments film screen contact, speed of screens-slow parfast care of intensifying screens . Intensification factors numeral proof and rare earth screens.

1. Mounting of intensifying screens.
2. Screen film contact.

**Film Processing-**

Auto processing material for processing equipment and annual processing control on temperature chemical in Dark room the PH Scale.

1. X-ray Developer
2. X-Ray Fixer
3. Film Rinsisng Washing & Drying
4. Preparation of processing chemicals, loading and unloading of cassettes,

**Presentation of Radiograph-**

record filling and report distribution.

**Film Artifacts-**

Definition, type an causes of radiation and photographic artifacts, factors affecting the quality control of radiograph.

**4)Radiograpghic General Procedures 30 Marks**

Intorduction- The Radiographic image (image formation, magnification image Distortion, Image, sharpness, Image contrast) Ex posure factor and Anatomical Terminology.

**Skeletal System-**

* Upper Limb- Procedure for thumb, fingers, meta carpals, hand corpometacarpel joints, wrist joint, carpo-radio-ulpar joint, forearm, elbow joint, arm, special views for scaphoid bone, olecranon process , supra condylar prljection in various type ofinjured patients.
* b) Lower limb- Procedure for toes, meta tarsalls, complete foot, trasoancaneal, talo calcaneal joint, lege with ankle joint legewith knee jointm knee joint, thigh with hip joint.
* c) Shoulder Girdle and Bony thorax- Procedures for scapula calvicle and head of humerus sternoclavicular joint , special views for clavicle. Head of humerus and scapula in various types of injured or dislocation cases.
* d) Vertebral Column- Normal curvature relative levels of vertebrae, procedures for atlanto-occipital joint, odontoid process, cervical spine , cervicodorsal spine , dorsalsspine, dorso-lumbar spine, and spondolysis.

**Chest-**

Procedures for chest at six feet, lying down and crect positions, inspiration and expiration views , special views like lordotic , decubitus, MMR portable teleradiography, chest in pregnancy. High Kilovolatage technique.

**Abdominal Pelvis-**

Preparation for procedure, procedure for upper abdomen, lower abdomen,KUB Gallbladder Stomach , small intestina and large intestine in supine and erect position, special views in case of perforation etc.

**Sinus-**

Procedures for paranasal sinuse, (frontal, ethmoid, sphenoid and maxillary sinuses ).

**Soft Tissue Radiography-**

Procedures for STM , STN abdomen and other body organs.

invetogram procedures, manipulation of positions, immobilization , exposure, FFD in abnormal conditions of patients.

**Hospital Practice and Care of patients-**

Set up of radiology department in Hospital, Hospital staffing and organization . Patients registration , record filling , cases put up and dispactch devices, medico legal aspect of profession . Professional relationship of radiographer with patient and organization staff.

**5)Special Investigation 20 Marks**

**Urinary Tract-**

Plain Radiographs for UB Intravenous pyelegraph, (IVP or IVU)Retrogratepyelegraphy , Micturting –cystourethrogram , Retrograte Urethrogram

**Gastro-Intestinal Tract-**

Plain Radiographs, abdomen, Barium Swallow, Bameal UGI Ba meal ET, Ba Enema, double contract Ba enema and instant Ba enema, Miscellaneous Procedures, Gastrograffm study, fluoroscopy,

**Biliary Tract-**

Introduction to biliary contrast media plain radiographs upper abdomen, oral choleystography (OCG) endoscopic Rtrograte choloctysto pancreatograpy (ERCP)

HSG

Fistulogram

Sinogram

**6)Basic principle and application of computerized tomography, ultrasound Magnetic resonance Imaging, Computer Radiography and Digital Radiography**  **20 Marks**

**7)Contrast Agents, Contrast Reaction and their management, Emergency Drugs used in Radiology Department 10 Marks**

Secretary

Services selection Board

Srinagar