

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS OF COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR (Board Speciality) RADIO-DIAGNOSIS MEDICAL EDUCATION DEPARTMENT

Unit: I Basic Science

- A. **Anatomy** –Embryology, Gross and cross-sectional anatomy of all the body systems of human.
- B. **Pathology** -Gross morphology of pathological conditions of systemic diseases affecting all organ systems.
- C. **Human Physiology** - Basic human physiology of all system & organs.

Unit: II Clinical Radio-diagnosis

This would cover imaging and interpretation of diseases affecting all the body systems:

1. **Musculo-skeletal System-** Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.
2. **Respiratory System-** Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
3. **Cardiovascular System-** Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotopes Studies.
4. **Gastro-intestinal tract and hepato-biliary pancreatic system-** Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Diseases and disorders of liver, biliary system and pancreas.
5. **Urogenital System-** Interpretation of various diseases and disorders of genitourinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.

6. **Central Nervous System (C.N.S.)**- Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.
7. Imaging in Emergency Medicine.
8. Imaging in Obstetrics and Gynecology.
9. Imaging of Breast and interventional procedures.
10. ENT, EYE and Dental Imaging.
11. Imaging of endocrine glands and those involved with metabolic diseases.
12. Clinical applied radionuclide imaging.
13. Interventional Radiology.

Unit: III Radiological Physics

1. Introduction of general properties of radiation and matter: Fundamentals of nuclear physics and radioactivity.
2. Interaction of x-rays and gamma rays with matter and their effects on irradiated materials.
3. X-ray Generating Apparatus.
4. Screen-film radiography.
5. Film processing: Dark room, dry processing, laser /dry chemistry cameras, artifacts.
6. Fluoroscopy: IITV, Digital including flat panel units and fluoroscopy cum radiography units.
7. Digital radiography: Computed Radiography, Flat panel radiography.
8. Other equipments: Ultrasound including Doppler, CT, DEXA, MRI, and DSA.
9. Contrast Media (Barium, Iodinated, MR & Ultrasound contrast) - types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management.
10. Nuclear Medicine: Equipments including scintigraphy, Bone scan, SPECT & PET. Isotopes in various organ systems and recent advances.
11. Radiation biology & Hazards, Radiation protection and dosimetry.
12. Image quality and Quality Assurance (QA).
13. Regulatory control for radiation in India & abroad- e-LORA, AERB, ICRP.

Unit: IV General & Specialized Radiography and processing techniques

1. Processing techniques: includes dark room and dry processing.
2. Radiography of the Musculo-skeletal system including extremities.
3. Radiography of the chest, spine, abdomen and pelvic girdle.

4. Radiography of the skull, orbit, sinuses.
5. Contrast techniques and interpretation of GI tract, hepato-biliary tract, pancreas etc.
6. Contrast techniques and interpretation of the Central Nervous system.
7. Contrast techniques and interpretation of the cardiovascular system including chest.
8. Contrast techniques and interpretation of the Genito - urinary system including Obstetrics and Gynaecology.
9. Paediatric radiology including MCU, genitogram, bone age.
10. Dental, portable and emergency (casualty) radiography.

Unit-V Recent advances in radio-diagnosis and imaging & its clinical applications

1. Ultrasound elastography, 3-D printing, 3-D & 4-D Ultra sonography.
2. Digital Mammography & tomosynthesis, Stereotactic Biopsy.
3. Dual energy CT scanner, CT fluoroscopy, CT angiography, MDCT.
4. Functional MRI, DTI & advanced MR sequences.
5. PET-CT, PET-MR.
6. Evidence based radiology.
7. Artificial intelligence in Radio-diagnosis.
8. Nuclear Molecular imaging.
9. Various Diagnostic & therapeutic interventions in Radio-diagnosis and their tools.
10. Picture Archiving and Communication System (PACS) and Radiology Information System (RIS) to make a film-less department and for Teleradiology.
11. Planning a Modern imaging Department.

Unit: VI Ethical & Medico-legal Issues in Radio-diagnosis

1. Medico-legal imaging reporting, PC-PNDT act with amendments, Consumer protection act.
2. Ethical issues, Doctor patient relationship, Image interpretation & reporting issues.

* * * * *

Pattern of Question Papers:

1. **Objective Type Paper**
2. **Maximum Marks: 150**
3. **Number of Questions: 150**
4. **Duration of Paper: 2.30 Hours**
5. **All Questions carry equal marks**
6. **There will be Negative Marking**
(For every wrong answer one-third of the marks prescribed for that Particular question shall be deducted.)