DETAILED SYLLABUS FOR THE POST OF ASSISTANT PROFESSOR IN RADIODIAGNOSIS IN MEDICAL EDUCATION - DIRECT RECRUITMENT

(Cat.Nos: 347/2023, 362/2023)

(Total marks 100)

1. **Imaging modalities and recent advances:(20 marks)**

Digital radiography: principles, CR systems, advantages , advances in DR- Digital mammography :basic physics , comparison of digital vs conventional mammography, advances like contrast enhanced mammography, subtraction mammography and digital breast tomosynthesis– Digital fluoroscopy :basic principles of fluoscopy, DSA- Ultrasound : basics of ultrasound imaging, instrumentation, fundamentals of doppler ultrasound, advances like tissue harmonic imaging , elastography infusion imaging , contrast enhanced uss, HIFU,ultrasound image artefacts- Computed tomography : basic principles in acquisition and reconstruction, hardware and software, HRCT, cone beam CT,CT angiography, CT perfusion studies, Dual energy and photon counting CT –MRI : basic principles of image formation and interpretation, Hardware and sequences, SWI, DWI, MRS,MR perfusion imaging, MRangiography, MRI safety

Radiation hazards - Units of radiation - Radiation protection : Principles and implementation, AERB guidelines –Radiography techniques – Basic Radiation physics : Xray tube, Properties and interactions of X rays, Cassettes film screen , Radiographic Grid , Radiographic contrast - Dark room techniques – Radiographic contrast media –Quality assurance in Radiography - Radiographic contrast media: classification, precautions , adverse reactions and management - Ultrasound contrast media – MRI contrast media - PACS and RIS (Radiology Information System)- PET and SPECT imaging – Radiofrequency Ablation – Introduction to Interventional Radiology

2. Paediatric imaging : (10 marks)

Imaging techniques and special considerations in paediatric radiography – Contrast imaging in paediatrics – Neurosonography - New born imaging : CNS, respiratory system, CVS, GIT, Hepatobiliary system, Genitourinary system, MSK, trauma - Paediatrics : diseases of chest , abdomen, pelvis , Brain & spine, msk– paediatric ILD - haematological malignancies- spinal dysraphysm – skeletal dysplasias – trauma

3. **Gastrointestinal and Hepatobiliary Imaging : (10marks)**

Imaging in GIT : plain Xray, contrast Xray, ultrasound, CT scan and MRI –Radiological Anatomy of GIT –anomalies - imaging techniques : Barium and water soluble contrast media as GI contrast agents – imaging in dysphagia- imaging in GI bleed - imaging in persistent vomiting

– intestinal obstruction –acute abdomen - Ascites - Abdominal masses- gastrointestinal tumours - Gastrointestinal tuberculosis –salivary glands- imaging of appendix -

Radiological anatomy of Liver, biliary system, spleen , pancreas, vascular anatomy-anomalies - imaging of jaundice –Cirrhosis and portal hypertension - diffuse liver diseases – focal liver lesions – imaging of liver transplantation – Disorders of biliary system : congenital anomalies, calculous diseases, infections, neoplasms – Pancreatitis – tumours of pancreas – cystic lesions – peritoneum and mesentery – abdominal trauma - Role of interventional Radiology in GIT and Hepatobiliary systems

4. **Respiratory and Cardiovascular imaging: (20 marks)**

Radiological anatomy of lungs, mediastinum, thymus –embryology and anomalies of lung- Radiography of chest –chest CT anatomy and techniques - HRCT chest : Principles & anatomy - MRI of chest

Basic radiological patterns of lung diseases and interpretation - Imaging in pulmonary tuberculosis - Non tubercular pulmonary infections – pulmonary manifestations in immunocompromised host – imaging of solitary pulmonary nodule – imaging of pulmonary neoplasms –Pulmonary circulation :imaging of pulmonary embolism - mediastinal lesions – pattern recognition in ILD and interpretation – Chest imaging in ICU - Imaging in chest trauma – imaging of pleura- imaging of diaphragm and chest wall – chest ultrasound including POCUS – diagnostic and therapeutic interventions in chest

Radiological anatomy of heart including sectional and vascular anatomy - development of heart and major congenital heart diseases - chest Xray in evaluation of heart diseases - imaging in IHD – imaging in cardiomyopathies - imaging of cardiac masses – imaging of valvular heart diseases – imaging of pericardium - cardiac scintigraphy - Phlebography – lymphatic system - imaging interventions in aorta, ivc ,peripheral vessels

5. **Genitourinary system : (10 marks)**

Radiological anatomy of kidney, ureter, bladder,urethra – imaging techniques includes IVP, MCU, RGU, CT urogram, MR urogram, radionucleide studies - renal calculus and obstructive uropathy- renal neoplasms both benign and malignant- renal parenchymal diseases -renal infections - renal cysts – renal transplantation - renovascular hypertension- diseases of urinary bladder and urethra - urinary tract trauma

Radiological anatomy of uterus, ovaries, fallopian tubes ,vagina,prostate & seminal vesicles, pelvis (male and female), scrotum- imaging techniques include HSG, sonosalpingography, genitogram, TRUS- benign lesions of uterus,ovaries and vagina- malignant lesions of uterus,ovaries and vagina - imaging in infertility both male and female- erectile dysfunction -diseases of prostate-imaging of scrotal lesions- Adrenal glands- retroperitoneum-

Role of interventional radiology in Genitourinary tract

6. **Muskuloskeletal and breast imaging :(10marks)**

Bones and joints : general principles in Radiographic imaging and interpretation –major joints : USS,CT and MR techniques of hip, shoulder, knee , elbow, wrist, TMJand spine –MR arthrography- radiological evaluation of arthritis : infective, degenerative and inflammatory - MR imaging of hip, shoulder,knee, elbow, and wrist joints - metabolic and endocrine disorders of MSK system-osteoporosis –infections of bone - Bone tumours : benign and malignant : approach –Bonemarrow imaging- Radiology in MSK trauma - MSK interventions - MSK scintigraphy

Imaging of soft tissue - imaging of peripheral nerves

Radiological anatomy of mammary gland – vascular supply and lymphatic drainage – mammography technique –BIRADS - ductography - sonomammography – MRI breast – Benign and malignant lesions of breast – male breast imaging - breast interventions

7. **Neuroradiology including head and neck imaging : (20marks)**

Sectional anatomy of brain in CT and MRI- vascular anatomy – imaging techniques in Brain CT and MRI - MRS – Functional MRI - Stroke imaging - imaging and interventions in intracranial bleed – neurotrauma – neuroinfections –Imaging in white matter diseases – imaging in epilepsy – Brain tumours : benign and malignant , sellar parasellar masses, intraventricular lesions, CP angle lesions , posterior fossa tumours – Neurodegenerative diseases – imaging of calvarium

HRCT anatomy of temporal bone - imaging of temporal bone – imaging of orbit, PNS , neck spaces , thyroid – imaging of pharynx - Teeth and Jaw - skull base lesions - maxillofacial imaging – CVJ anomalies

Radiological anatomy of spine - Radiography of spine - CT and MR imaging of spine and spinal cord - spinal trauma – spinal neoplasm - IVDP –infections and vascular diseases of spine – spinal dysraphysm

Neuro interventions

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NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.