October, 2015

STATE MEDICAL FACULTY OF WEST BENGAL

Final Examinations
for Post-DRD Advanced Imaging Certificate Course

Paper – I
BASIC ANATOMY

Time : 3 Hours | Full Marks : 80

Question 1 is Compulsory.
Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

Q-1) Mark (√) for the correct Answer: **10x1 = 10**

i) Number of lobes in right lung:
a) 2 c) 4
b) 3 d) 5

ii) In an adult the spinal cord ends at the vertebral level of:
a) D4 c) L1
b) D10 d) L5

iii) Investigation of choice for detection and characterization of interstitial lung disease:
a) MRI c) HRST
b) Digital X-ray of Chest PA View d) CECT

iv) Coracoid process is part of:
a) Femur c) Scapula
b) Patella d) Vertebra

v) Calcification is best detected with:
a) CT scan c) MRI T1 WI
b) Digital X-ray d) MRI T2 WI

vi) The following Imaging is the gold standard for diagnosis of cerebral AVM:
a) Colour Doppler c) MR angiography
b) CT angiography d) Digital subtraction angiography

vii) MRI was discovered by:
a) W.C. Roentgen c) G.M. Hounsfield
b) Bloch & Purcell d) M. Curie

viii) The following is the investigation of choice to detect gallstone:
a) USG c) CT scan
b) Digital X-ray d) MRI

ix) In CT scan HU number of water:
a) - 50 c) + 1000
b) 0 d) - 1000

x) Which artery does not supply to the brain?
a) Internal carotid c) Middle cerebral
b) External carotid d) Posterior cerebral

Contd.....P2/

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BASIC ANATOMY

Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

2x20 = 40

Q2. Name the different bones of vault of skull. Draw a labeled diagram of CSF pathway in the brain.

6+14 = 20

Q3. Draw the diagram of the lungs and mention their borders, surfaces, fissures and lobes.

8+3+3+3+3 = 20

Q4. Name the paranasal sinuses. Draw a diagram with proper labeling.

8+12 = 20

Q5. Describe the bones taking part in the formation of shoulder joint. Draw a diagram. What type of joint is it? What type of movement is possible in the shoulder joint? What are the components of Rotator cuff?

4+4+2+5+5 = 20

Q6. Write short notes on (**Any Four**):- **4 x 7½ = 30**

a) Bronchopulmonary segments;
b) Iliocaecal junction;
c) Diffusion Weighted Image;
d) Direct Radiography;
e) S.I. Joint.

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Paper – II
RADIOLOGICAL PHYSICS

Time : 3 Hours | Full Marks : 80

Question 1 is Compulsory.
Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

Q-1) Mark (√) for the correct Answer: **10x1 = 10**

i) MRCP is done to visualize:
- a) Billiary tree
- b) Ureter
- c) Fallopian tube
- d) Parotid duct

ii) Gadolinium contrast is used in:
- a) Digital X-ray
- b) USG
- c) CT
- d) MRI

iii) Atomic number of tungsten:
- a) 57
- b) 70
- c) 74
- d) 78

iv) T-Tube choloangiography is done on the following post-operative day:
- a) 3rd
- b) 6th
- c) 10th
- d) 15th

v) CT scan was invented by:
- a) Godfrey Hounsfield
- b) Gustave Bucky
- c) W.C. Roentgen
- d) Lauterbur

vi) DSA done on the diagnosis of:
- a) Gallstone
- b) Intra cerebral haemorrhage
- c) A. com Aneurysm
- d) Intra cerebral tumor

vii) The following imaging is indicated for the diagnosis of acute intra cerebral haemorrhage:
- a) Digital X-ray
- b) CT scan
- c) MRI scan
- d) DSA

viii) Temporal resolution is best with the following imaging:
- a) Digital X-ray
- b) USG
- c) MD CT scan
- d) MRI

ix) Guided biopsy is best done with the following:
- a) Digital X-ray
- b) CT scan
- c) MRI
- d) DSA

x) DSA is done usually with the puncture of following artery:
- a) Right common carotid artery
- b) Left common carotid artery
- c) Right common femoral artery
- d) Left subclavian artery

Contd.....P2/

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Paper – II
RADIOLOGICAL PHYSICS

Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

2x20 = 40

Q2. Compare computed radiography (C.R.) and digital direct radiography (D.R.). Write the advantages of D.R. over computed radiography. What is PACS?

8+8+4 = 20

Q3. Enumerate the different generations of CT scan. What is multi detector CT (MDCT)? Write down the advantages of CT scan over MRI scan.

7+6+7 = 20

Q4. Name the usual pulse sequences in MRI. What are the advantages and disadvantages of 1.5 T superconducting magnets over the 0.2 T open gantry magnets? What are the indications of diffusion weighted image?

6+8+6 = 20

Q5. Describe how you will perform a DSA of intra cerebral arteries in a female patient of 45 years. Draw a labelled diagram of Circle of Willis.

10+10 = 20

Q6. Write short notes on (**Any Four**):- **4 x 7½ = 30**

a) Basic principles of Color Doppler;
b) Cardiac CT;
c) Rare earth screens;
d) Seldinger's technique;
e) Maximum intensity projection (MIP).

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STATE MEDICAL FACULTY OF WEST BENGAL

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Paper – III
RADIATION PROTECTION

Time : 3 Hours | Full Marks : 80

Question 1 is Compulsory.
Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

Q-1) Mark (√) for the correct Answer: **10x1 = 10**

i) Standard thickness of lead apron used in Radiology:
- a) 0.5mm
- b) 1mm
- c) 1.5mm
- d) 5mm

ii) All of the following has radiation hazards, except:
- a) Digital X-ray
- b) Color Doppler
- c) CT
- d) MRI

iii) X-ray was discovered in the year:
- a) 1890
- b) 1901
- c) 1908
- d) 1895

iv) X-ray was generated from:
- a) Protons
- b) Electrons
- c) Neutrons
- d) Nucleus

v) Which of the following reduces scatter radiation?
- a) Grid
- b) Filter
- c) Intensifying screen
- d) Rare earth material

vi) In DSA cathlab the following are used for protection against radiation hazards:
- a) Lead jacket
- b) Lead glass
- c) Thyroid guard
- d) Cap and musk

vii) All are members of electro magnetic radiation, except:
- a) Digital X-ray
- b) Light
- c) Radiant heat
- d) USG

viii) In grids the spaces between lead strips are filled with:
- a) Air
- b) Aluminium
- c) Tungsten
- d) Molybdenum

ix) Hounsfield value of CSF is:
- a) -1000
- b) 0
- c) 8-10
- d) +1000

x) Chest X-ray PA view is usually done instead of AP view:
- a) To prevent radiation damage to lens of eye ball
- b) For better resolution
- c) For better evaluation of rib injury
- d) For better evaluation of heart

Contd.....P2/

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Paper – III
RADIATION PROTECTION

Answer any Two from Question No. 2 to 5 and any Four from Question No. 6

2x20 = 40

Q2. Write the principles of radiation protection. What are the measures taken in X-ray room for radiation protection of radiographers and general public?

8+12 = 20

Q3. Enumerate the sources of radiation exposure. What do you mean by ionizing radiation? Discuss about biological effects of radiation.

5+5+10 = 20

Q4. Write down the steps to prevent radiation during installation of a CT scan machine. Draw a labeled diagram of a total CT scan unit.

10+10 = 20

Q5. What precautions you will take before and during DSA procedure of intra cerebral angiography? Draw a labeled diagram of arch of angiography and its major branches.

10+10 = 20

Q6. Write short notes on (**Any Four**):- **4 x 7½ = 30**

a) ALARA;
b) TLD;
c) KV & mA;
d) PET CT scan;
e) Collimator.

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