

22547

11920

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (7) Preferably, Write the answer in sequential order.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Enlist any two types of Electromagnetic Radiations.
 - b) Explain the need of timer in x-ray machine.
 - c) Write two image intensifier artifacts.
 - d) Define RF sheilding.
 - e) Write any two types of transducer arrays used in ultrasound imaging.
 - f) Write the purpose of PET scan.
 - g) Write the purpose of SPECT scan.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Write four medical application of X-rays.
- b) Explain with sketch the concept of Digital Radiography.
- c) Enlist components of CT machine and explain basic principle working of CT machine.
- d) Draw piezoelectric ultrasound transducer and describe working of it.

3. Attempt any THREE of the following: 12

- a) Draw image intensifier tube and describe its working.
- b) Identify the blocks A and B from figure below and write functions of block A and block B.



- c) Describe procedural steps of Maintenance for MRI machine.
- d) X-ray is having Kvp rating of 50Kvp, Miliampere rating of 50mA and X-ray emits for 9 second. Calculate heat unit value (HU) for this tube.

4. Attempt any THREE of the following: 12

- a) Draw sketch of stationary Anode tube and give functions of the control knobs.
 - (i) Exposure Switch
 - (ii) Timer Knob.
- b) State the causes of faults occurring in an ultrasound scanner.
 - (i) Machine does not work.
 - (ii) Ultrasound does not generate of required frequency.
 - (iii) Image quality is poor.
 - (iv) Display is poor.
- c) Write the risk involved in handling X-ray machine.
- d) Enlist the components of MRI system and write the risks involved in handling the MRI machine.
- e) Write installation step for Angiography machine.

- 5. Attempt any TWO of the following:** **12**
- a) Enlist any three Image Reconstruction Techniques in CT and explain any one technique with a neat sketch.
 - b) Enlist different ultrasound scan modes. Describe TM scan mode.
 - c) Enlist two Nuclear Transducers and describe any one with sketch.
- 6. Attempt any TWO of the following:** **12**
- a) Draw block diagram of gamma camera and describe it's working.
 - b) Define Doppler effect and explain principle of working of Doppler Ultrasound machine.
 - c) Write Installation steps for C-arm machine and write safely tips for C-arm fluroscopy.
-