

22547

12425

03 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answer with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: 10**
- a) Draw X-ray spectrum.
 - b) Write two medical applications of X-ray
 - c) Define fluoroscopy and radiography.
 - d) Define RF shielding.
 - e) Write any two types of transducers arrays used in ultrasound imaging.
 - f) Write purpose of SPECT scan.
 - g) Write working principle of thermography.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Write risks involved in handling X-ray machine.
 - b) Write steps for installation of 'C' arm fluoroscopy machine.
 - c) Draw the block diagram of MRI machine and describe its working in detail.
 - d) Write steps in installation of ultrasound machine.
- 3. Attempt any THREE of the following:** **12**
- a) Draw image intensifier tube and describe its working.
 - b) Draw the block diagram of X-ray machine and state function of each part.
 - c) Enlist various image reconstruction technique used in CT. Draw the block diagram of CT machine.
 - d) X-ray is having KVp rating of 60 KVp,, milliamperage rating of 40 mA and X-ray emits of 10 seconds. Calculate the Heat Unit (HU) for the tube.
- 4. Attempt any THREE of the following:** **12**
- a) Draw the diagram of X-ray tube.
 - b) State the causes of faults occurring in an ultrasound scanner:
 - i) Machine does not turn ON
 - ii) Ultrasound does not generate the required frequency
 - iii) Image quality is poor
 - iv) Display is poor.
 - c) List any four properties of X-rays.
 - d) Enlist the component of MRI system and write the risks involved in handling the MRI machine.
 - e) Write installation steps for Angiography machine.

5. Attempt any TWO of the following:**12**

- a) Describe the risks involved in handling MRI machine.
- b) List ultrasound artifacts and suggest possible remedies.
- c) Enlist two nuclear transducers and describe any one in detail with neat sketch.

6. Attempt any TWO of the following:**12**

- a) Describe preventive maintenance steps in maintenance thermography machine.
 - b) Describe:
 - i) Pulse echo techniques
 - ii) Principle of Doppler ultrasound.
 - c) Differentiate between radiography and fluoroscopy (Any six points).
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