

17673

15162

3 Hours / 100 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 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.

Marks

1. a) Attempt any THREE of the following: 12
- (i) State the working principle of nuclear imaging.
 - (ii) Prepare a list of any four steps to be carried out for maintenance of ultrasound machine.
 - (iii) Draw a neat labelled block diagram and state the function of each block of MRI detection system.
 - (iv) With neat labelled diagram state working principle of endoscopy.
- b) Attempt any ONE of the following: 6
- (i) State the significance of angiography. Draw the block diagram of angiography system and write the function of each block.
 - (ii) Draw block diagram of X-ray machine and state the function of each block.

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- 2. Attempt any FOUR of the following:** **16**
- a) Enlist the techniques of image reconstruction and write any one technique with neat diagram.
 - b) Write any four properties of ultrasound.
 - c) Explain transducers used in nuclear medical imaging.
 - d) Sketch symbols, label, terminals and sketch V-1 characteristics of SCR and DIAC.
 - e) Define the term maintenance and state three step's carried out in maintenance of angiography machine.
 - f) State the steps carried out in installation of MRI machine.
- 3. Attempt any FOUR of the following:** **16**
- a) With neat labelled diagram explain working of ultrasonic transducer.
 - b) Draw neat labelled diagram and state working of thermography machine.
 - c) Write the process of conversion of X-Ray quanta into a Bright output image with the help of diagram of image intensifier tube.
 - d) Write stepwise maintenance procedure for X-Ray machine.
 - e) State the working principle of MRI system with neat diagram.

4. a) Attempt any THREE of the following: 12

- (i) State any two types of magnets used in MRI and define the terms RF shielding shimming.
- (ii) Define the term installation. Following are the faults noted in endoscopy machine give remedy to find out faults
 - 1) Light not functioning
 - 2) Occurrence of image is not clear/picture is cloudy.
- (iii) List advantages and disadvantages of X-rays.
(Any two of each)
- (iv) State four steps to be carried out in installation of angiography machine.

b) Attempt any ONE of the following: 6

- (i) What are the risk factors involved in handling X-ray machine. Following are the faults noted in X-ray machine give remedy to find out faults.
 - 1) Machine does not work
 - 2) Radiograph do not show desired object
 - 3) More dark image or high density
 - 4) Weak image, low image density
- (ii) Differentiate between fluroscopy and radiography based on following points.
 - 1) Diagram
 - 2) Working principle
 - 3) Application
 - 4) Viewing media
 - 5) Advantages
 - 6) Disadvantages

- 5. Attempt any FOUR of the following:** **16**
- a) With neat labelled diagram explain working of gamma camera.
 - b) Draw a neat labelled diagram and state working of B-scanner technique of ultrasound.
 - c) Write any four biological effect's of MRI.
 - d) Write four steps for installation of X-Ray equipment.
 - e) With a neat labelled diagram explain working of high voltage control circuit for X-Ray.
 - f) State the significance of CT number and list any two medical application of CT machine.
- 6. Attempt any FOUR of the following:** **16**
- a) Write any four medical application of X-ray.
 - b) With a neat labelled diagram explain working of CT machine.
 - c) State any four properties of ultrasound.
 - d) List four steps for maintenance of endoscopy machine.
 - e) Write stepwise installation procedure for ultrasound machine.
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