17673

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) 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 basic difference between nuclear imaging and other imaging modalities. List the transducer used in nuclear medicine imaging.

(ii) Write four steps to be carried out for installation of ultrasound machine.

(iii) With a neat labelled diagram explain MRI detection system.

(iv) Following are the faults noted in endoscopy machine give remedy to find out the fault.

1) No fluid flow or suction through scope

2) Picture is cloudy

3) Light not functioning

4) Fluid invasion

Marks

b) **Attempt any ONE of the following:** **6**

(i) Draw block diagram of angiography system state function of each block and state its two advantages.

(ii) What is exposure timer? List types of timer circuits used in X-ray machine. Explain any two types of exposure timer used in X-ray machine.

2. Attempt any FOUR of the following: **16**

a) State any four clinical applications of CT scan.

b) State the principle of A scan.

c) Draw a neat labelled diagram and state working of thermography machine.

d) Sketch symbols, label terminal and sketch V-I characteristics of SCR and DIAC.

e) Define the term maintenance and state the steps carried out in maintenance of angiography machine.

f) State the risk factors involved in handling CT and MRI machines.

3. Attempt any FOUR of the following: **16**

a) Draw a neat labelled diagram and state the working of linear and phased array transducer.

b) Draw block diagram of endoscopy machine and state its working principle.

c) Describe the working of television camera with suitable diagram.

d) Write stepwise procedure for maintenance of X-ray machine. (any four steps)

e) State the working principle of MRI with suitable diagram.

Marks

4. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) What is MRI. List any two types of magnet's used in MRI.

(ii) Name the instruments used for the following applications and write their principle of working.

1) Mammography

2) Examination of digestive tract.

(iii) Draw a neat diagram of X-ray spectrum and explain it.

(iv) Define the term installation and state the steps to be carried out for installation of angiography machine.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) What are the risk factors involved in X-ray machine. Write stepwise procedure of installation of X-ray machine (any four steps)

(ii) What is the difference between fluroscopy and radiography. State any four applications of fluroscopy.

5. **Attempt any <u>FOUR</u> of the following:** **16**

a) Draw neat labelled diagram of gamma camera and explain it.

b) List any four clinical applications of ultrasound.

c) Write any four biological effects of magnetic resonance imaging.

d) State advantages and disadvantages of X-rays (any two of each)

e) Write any four medical applications of X-rays.

f) List clinical application of CT. (any four)

Marks

6. Attempt any FOUR of the following: **16**

a) Why tungsten material is preferred as a target material in X-ray tube? Name the other materials that can be used as target materials.

b) State and explain the terms

(i) Working principle of CT machine

(ii) CT number

c) Enlist any four important technical specifications of ultrasound scanner.

d) Describe the maintenance procedure for NMI machine.

e) State any four properties of ultrasound.