

**Scheme –I**  
**Sample Question Paper**

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fifth  
**Course Title** : Medical Imaging Equipment  
**Marks** : 70

22547

**Time: 3 Hrs.**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1) Attempt any FIVE of the following.**

**10 Marks**

- a) Write two properties of X ray
- b) Write two benefits of mobile X ray technology
- c) Define fluoroscopy and radiography
- d) Define CT number. Write CT number for water and air.
- e) Write 2 properties of ultrasound.
- f) Write the purpose of PET scan.
- g) Write the purpose of SPECT scan.

**Q.2) Attempt any THREE of the following.**

**12 Marks**

- a) Write steps of installation of X-ray machine
- b) Write safety tips in handling the C arm fluoroscopy.
- c) Draw block diagram of MRI machine and describe working of it.
- d) Draw piezoelectric ultrasound transducer and describe working of it.

**Q.3) Attempt any THREE of the following.**

**12 Marks**

- a) Draw image intensifier tube and describe working of it.
- b) Draw the block diagram of X ray machine and describe working of it.
- c) Enlist various image reconstruction technique used in CT. Draw block diagram of CT machine.
- d) X ray is having KVp rating of 60 KVp, miliampere rating of 60mA and X ray emits for 10 seconds. Calculate the heat unit value(HU) for this tube.

**Q.4) Attempt any THREE of the following.**

**12 Marks**

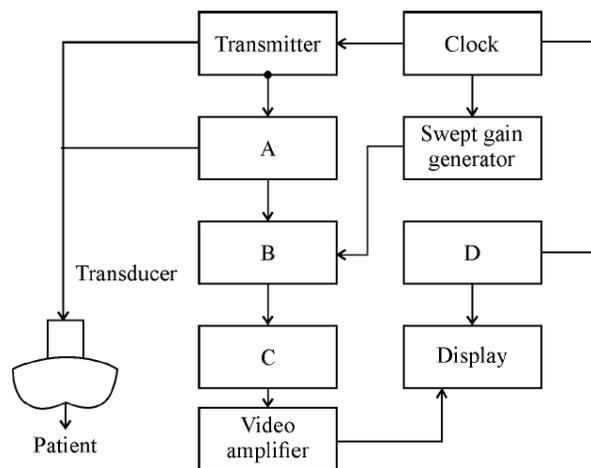
- a) Draw diagram of X ray tube. Which controls in the X-ray machine are responsible for  
1) Quality of X rays 2) Quantity of X rays

- b) State the causes of faults occurring in an ultrasound scanner:
1. Machine does not turn on.
  2. Ultrasound does not generate of required frequency
  3. Image quality is poor
  4. Display is poor
- c) List 2 advantages and 2 disadvantages of X-rays.
- d) Write clinical applications of CT machine.
- e) Write steps of maintenance of angiography machine

**Q.5) Attempt any TWO of the following.**

**12 Marks**

- a) Write risk involved in handling the CT machine (3 points) and MRI machine (3 points).
- b) Identify the diagram and also identify missing blocks in it.



- c) Draw diagram of thermography machine and describe it's working.

**Q.6) Attempt any TWO of the following.**

**12 Marks**

- a) Write risk involved in handling PET and SPECT scan.
- b) Write steps in installation of ultrasound scanner.
- c) Differentiate between radiography and fluoroscopy (6 points).

**Scheme –I**  
**Sample Test Paper - I**

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fifth  
**Course Title** : Medical Imaging Equipment  
**Marks** : 20

22547

**Time: 1 Hour**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) Describe function of Filter, Bucky tray.
- b) List two X rays properties.
- c) Draw a labeled diagram of fluoroscopy.
- d) Give significance of angiography.
- e) Give clinical applications of Computed Tomography.
- f) Draw the diagram of rotating anode X ray tube.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) State the need and placement of grid and collimators in X ray machine with suitable example.
- b) State the causes of the faults occurring in an X ray machine if :
  - i) Milliammeter indicates flow of excessive current which does not change by mA control.
  - ii) More dark images are obtained
- c) Draw the construction of X ray tube. Describe it in detail.
- d) Write steps for installation of an angiography machine.
- e) Write steps for C arm fluoroscopy machine
- f) Describe CT machine with the help of neat block diagram.

**Scheme –I**  
**Sample Test Paper - II**

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fifth  
**Course Title** : Medical Imaging Equipment  
**Marks** : 20

**22547**

**Time: 1 Hour**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) Describe the term RF shielding, RFshimming related to MRI.
- b) Write 2 biological effects of MRI imaging.
- c) Write principle of Doppler ultrasound.
- d) Write 2 properties of ultrasound.
- e) Draw Geiger Muller tube and name the parts.

**Q.2 Attempt any THREE.**

**12Marks**

- a) Differentiate between SPECT scan and PET scan
- b) Write installation steps of thermography machine.
- c) Describe the types of magnets used in MRI machine.
- d) Describe linear switched array in ultrasound scanner with neat diagram.
- e) Describe B scan mode in ultrasound scanner with neat diagram.
- f) Write 4 technical specifications of ultrasound scanner.
- g) Write steps in maintenance of CT machine.