Scheme – G

Sample Test Paper - I

Course Name : Diploma in Medical Electronics

Course Code : MU

Semester : Sixth

17673

Subject Title : Medical Imaging Equipment.

Marks : 25 **Time:1 Hour**

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.

Q1. Attempt any THREE **9 Marks**

a) Sketch symbols, label terminals and sketch V-I characteristics of SCR, TRIAC and DIAC

b) State the importance of bellows used in X-RAY tube assembly?

c) Enlist any three medical applications of X-RAY machine.

d) Justify role of image intensifier in X-RAY machine.

Q2. Attempt any TWO **8 Marks**

a) State the function of following components in x-ray imaging.

i) Grid ii) Collimator iii) Filter iv) Film

b) State any four properties of X-rays.

c) Explain the steps carried out in film processing of X-RAY machine

Q3. Attempt any TWO **8 Marks**

a) State the steps carried out in installation of angiography machine.

b) What is the use of timers in X-RAY machine? Enlist any two types of electronic timers in it.

c) List out different parts of CT machine.

Scheme – G

Sample Test Paper - II

Course Name : Diploma in Medical Electronics

Course Code : MU

Semester : Sixth **17673**

Subject Title : Medical Imaging Equipment.

Marks : 25 **Time:1 Hour**

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.

Q1. Attempt any THREE **9 Marks**

a) MRI scan is better than -----scan Give any three reasons.

b) Draw a diagram of endoscopy and label it.

c) Define piezo electric effect with neat diagram.

d) List different types of magnets used in MRI. (any Three)

Q2.Attempt any TWO **8 Marks**

a) Draw a labeled block diagram of Computed Tomography

b) With neat diagram describe the working of phased array transducer.

c) Give the application area of following imaging techniques.

i) CT ii) MRI iii) Thermograph iv) Ultrasound.

Q3. Attempt any TWO **8 Marks**

a) List the risk factors involved in handling ofMRI (any04).

b) Write down steps for installation of MRI machine.

c) With neat diagram illustrate the term FID(Free Induction Decay)

Scheme – G

Sample Question Paper

Course Name : Diploma in Medical Electronics

Course Code : MU

Semester : Sixth

17673

Subject Title : Medical Imaging Equipment.

Marks : 100 **Time: 3 HourS**

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.

Q1. A) Attempt any THREE **12 Marks**

a) Enlist the two transducers used in Nuclear Medical Imaging and sketch with labels any one amongst them.

b) ii) Following are the faults noted in Ultrasound machine give the remedy to find out fault

i) Machine does not start.
ii) Occurrence of image is not clear.

c)

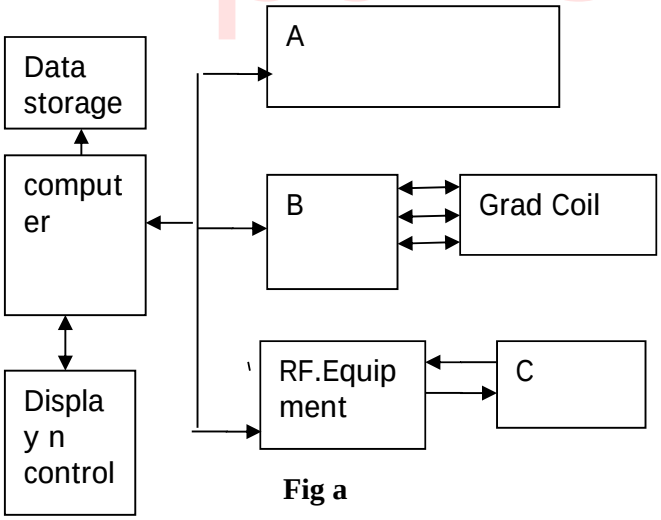

Fig a

Identify Fig a Label the blocks A, B, C correctly

d) State the basic principle of working of nuclear imaging.

Q1. (B) Attempt any one. **06 Marks**

a) Give the significance of angiography. Draw the block diagram of angiography system state function of each block.

b) In the given fig b. identify the position of grid and collimator. With neat diagram give function of same in X- ray machine.

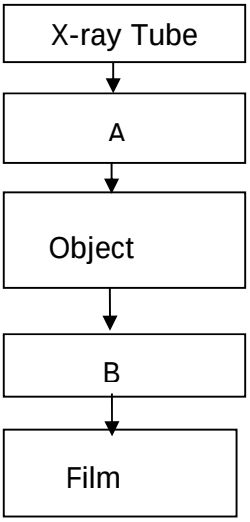

Fig b.

Q.2 Attempt any FOUR. **16 Marks**

a) State the working principle of CT(computed tomography) with neat diagram.
b) Enlist any four important technical specifications of Ultrasound Scanner.
c) State the meaning of word "Endoscope "and Draw the block diagram of endoscopy machine.
d) Sketch symbols, label terminals and sketch V-I characteristics of SCR and DIAC.
e) Define the term Installation and state the steps carried out in Maintenance of angiography machine.
f) State the steps carried out in Installation of MRI machine.

Q3. Attempt any FOUR. **16 Marks**

a) Draw a labeled diagram of A scanner and state function of each block.
b) Draw a neat labeled block diagram of Gamma camera and write importance of collimator and photomultiplier tube in the same.
c) With a neat labeled diagram of an Image Intensifier tube write the process of conversion of x-ray quanta into a bright output image.
d) Write the stepwise installation procedure for X-Ray machine.
e) State the working principle of MRI system with neat diagram.

Q4. (A)Attempt any THREE. **12 Marks**

a) Draw labeled diagram for basic components of NMR system.
b) Identify the missing block in Fig c of endoscope and give the function of each block

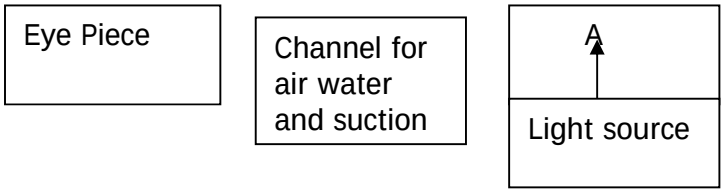

Fig c

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c) List advantages and disadvantages of x-rays.(any two of each)

d) Define the term Maintenance and state the steps carried out in Installation of angiography machine.

Q4. (B) Attempt any ONE. 06 Marks

a) Draw and explain a fault finding tree for x-ray machine.

b) Differentiate between Fluoroscopy and radiography based on following points.

i) Diagram ii) Working principle iii) Application iv) Viewing media used v) Advantage vi) disadvantage.

Q5. Attempt any Four. 16 Marks

a) For viewing the vital processes such as blood circulation, metabolism and vitality of organs and tumors which imaging technique is used and write the significance of radioactive Isotopes.

b) Identify the missing blocks in (Fig d) B-scanner Technique of ultrasound. State the function of same blocks .

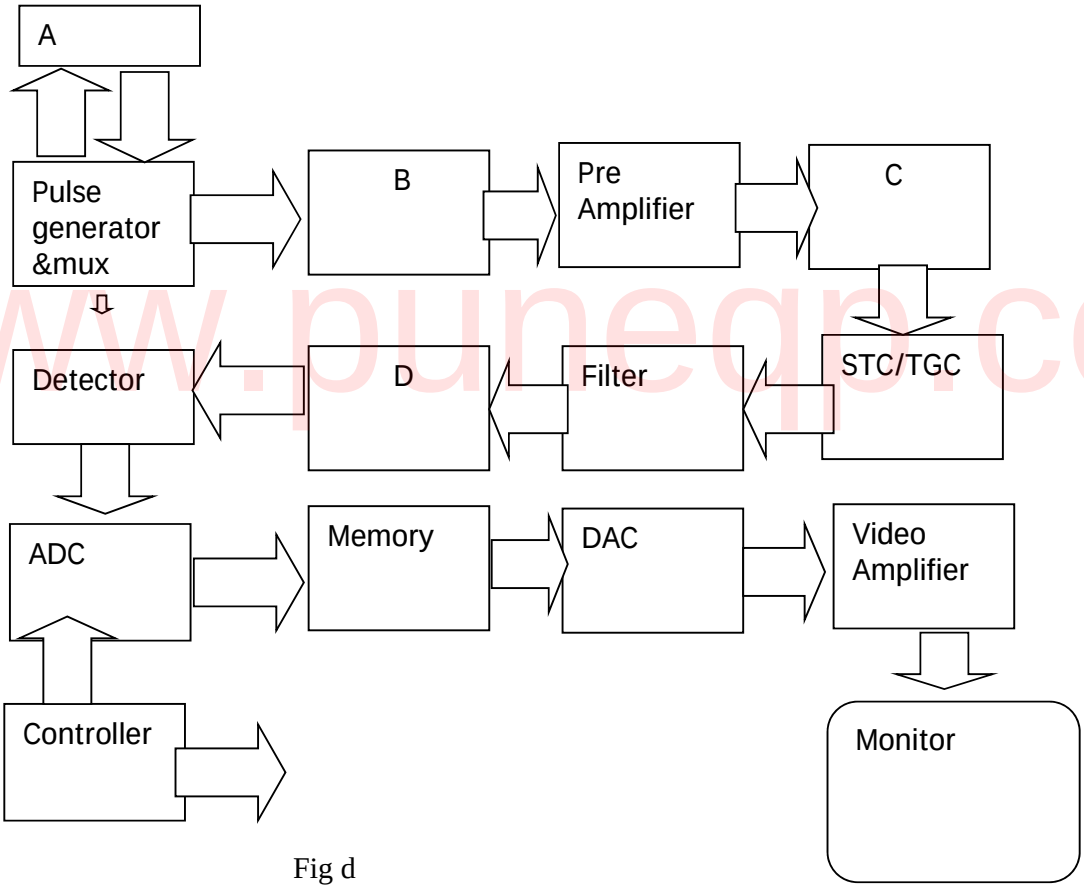

Fig d

c) List biological effects of Magnetic Resonance imaging. (Any 04)

d) State the risk factors involved in handling of x-ray equipment.

e) State the function of heat unit .which parameter of X-RAY is decided by it.
Calculate the heat unit for x-ray tube which is having 1) voltage=60Kvp 2) current rating=60Ma and time of exposure=10secs

f) State the significance of CT number.

Q6. Attempt any FOUR. **16 Marks**

a) List out the medical applications of x-ray. (Any four)

b) Identify the following equation given below and give the significance of each term in the Equation and in which imaging technique it is used. ($I_t = Io\ e^{-\mu x}$)

c) Define the term characteristic impedance related to ultrasound and give its importance for Ultrasound image.

d) Describe the maintenance procedure for NMI machine.

e) Write stepwise Installation procedure for ultrasound machine.