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3 Hours / 100 Marks

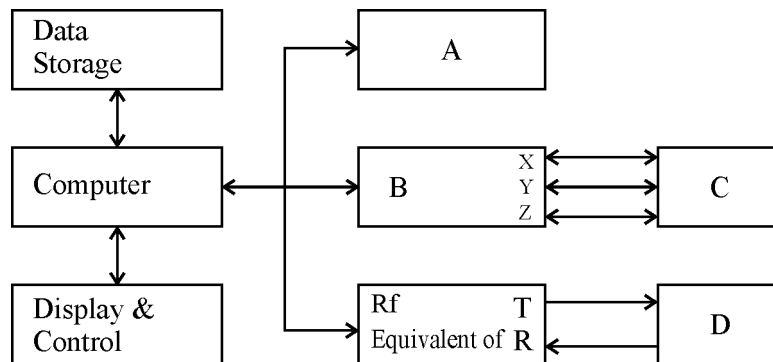
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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.

Marks1. (A) Attempt any **THREE** of the following :**12**

- (a) State the working principle of Nuclear imaging.
- (b) List out the steps to be carried out for maintenance of ultrasound machine.
- (c) Identify the missing blocks in given figure A and also state function of each block :

**Fig. A**

- (d) List medical application of following NMI techniques :
 - (i) Endoscopy (any two)
 - (ii) Thermography (any two)

(B) Attempt any ONE of the following :

6

- (a) Draw neat labelled block diagram of angiography. State function of each block. Also give the significance of angiography.
- (b) Identify position of grid & collimator in given figure B. With neat diagram, give function of same in X-ray machine.

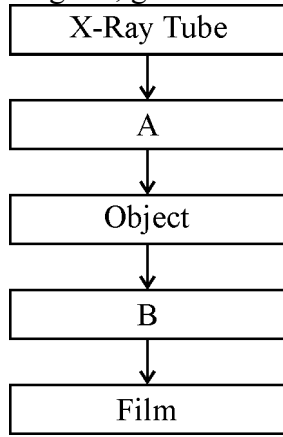
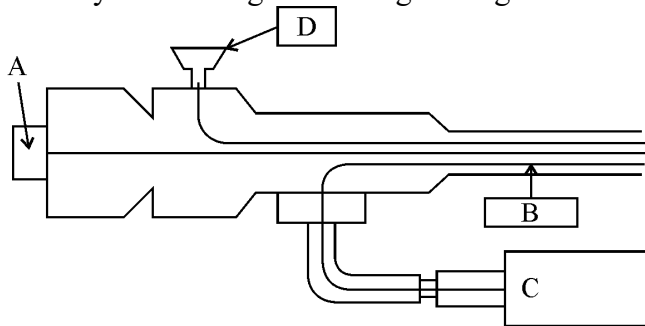


Fig. B

2. Attempt any FOUR of the following :

16

- (a) With neat diagram, explain any one image reconstruction techniques of CT.
- (b) List any four properties of ultrasound.
- (c) Identify the missing blocks in given figure C and also state their functions.



Endoscopy Machine

Fig. C

- (d) Identify the following components and draw their V-I characteristics. (refer fig. D)

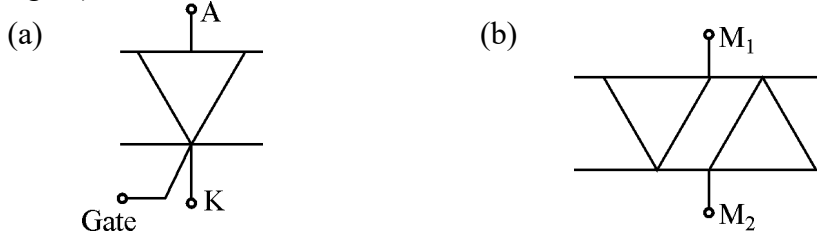


Fig. D

- (e) List out the steps to be carried out for installation of angiography.
- (f) Explain risk involved in handling CT & MRI.

- 3. Attempt any FOUR of the following :** **16**
- (a) Elaborate with neat diagram construction and working of ultrasound transducer.
 - (b) Draw a neat labelled diagram of Thermography machine.
 - (c) Differentiate between Fluoroscopy and Radiography. (any four points)
 - (d) List stepwise procedure to be carried out for installation of X-ray machine.
 - (e) Describe different types of Magnets used in MRI.
- 4. (A) Attempt any THREE :** **12**
- (a) Define the following terms :
 - (i) RF Shielding
 - (ii) RF Shimming
 - (b) List the transducers used in NMI and explain any one.
 - (c) List any four medical application of X-ray.
 - (d) List out maintenance steps to be carried out for angiography machine.
- (B) Attempt any ONE :** **6**
- (a) List out steps to be carried out for maintenance of X-ray machine and also state the risks involved in handling X-ray equipment.
 - (b) With neat diagram, explain the working of fluoroscopy machine. List advantages of fluoroscopy over Radiography. (any four)
- 5. Attempt any FOUR of the following :** **16**
- (a) Identify the possible cause for the following faults in endoscopy :
 - (i) picture is cloudy or dark.
 - (ii) leakage in flexible cable.

- (b) Identify the diagram and also identify missing blocks in it. (refer fig. E)

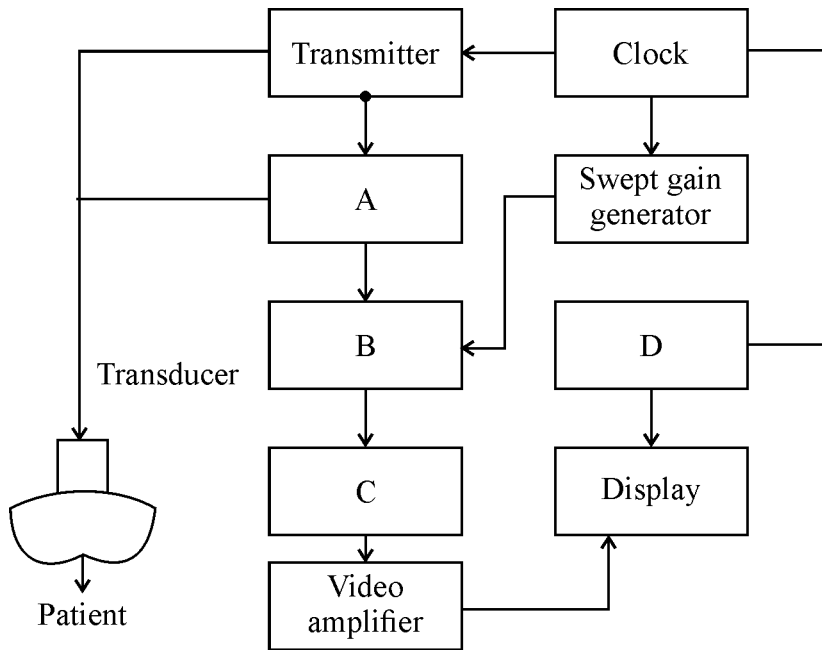


Fig. E

- (c) List any four advantages of MRI.
- (d) What will be the cause and action taken for the following faults in X-ray machine ?
- Machine does not work.
 - Radiograph does not show desired object.
- (e) With neat diagram, explain Characteristic Radiation and Bremsstrahlung Radiation.
- (f) List out any four clinical applications of CT.

6. Attempt any FOUR :

16

- List advantages and disadvantages of X-ray.
 - What is CT Number ? List the types of detectors used in CT.
 - List any four technical specification of ultrasound.
 - Draw a neat labelled diagram of gamma camera.
 - For the following faults in ultrasound suggest solution and possible causes of it :
 - fuse keeps blowing
 - poor image quality.
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