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Question Paper Code: 96B01

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Sixth Semester

Biomedical Engineering

19UBM601- MEDICAL IMAGING EQUIPMENTS

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Give the basic principles of angiography. CO1- U
2. Name few parts in the block diagram of X ray equipment. CO1- U
3. Write a technical note on collimation. CO2- U
4. Give the applications of spiral CT scan. CO2- U
5. Mention the advantages of the MRI over other medical imaging modalities. CO3- U
6. Give the principle of magnetic resonance signals CO3- U
7. What is the function of Scintillation detector? CO4- U
8. Define gamma camera CO4- U
9. Write the clinical significance of cyber knife. CO5- U
10. Give the functions of cyber knife. CO5- U

PART – C (5 x 16= 80 Marks)

11. (a) Draw the block diagram of an X-ray machine and describe its various components in detail. CO1- U (16)

Or

- (b) (i) Summarize the differences between Radiography and Fluoroscopy. CO1- U (8)
- (ii) Explain how image intensifier used in Fluoroscopy with neat sketch. CO1- U (8)
12. (a) Depict the block diagram of a Computer Tomography scanner and explain the various blocks in it. CO2- U (16)
- Or
- (b) (i) Explain the image reconstruction through back projection technique. CO2- U (8)
- (ii) Write short note on ultrafast CT scanners. CO2- U (8)
13. (a) Draw the block diagram of a MRI system and explain the image reconstruction using it. CO3- U (16)
- Or
- (b) (i) Explain the three principle MRI parameters with regard to relaxation processes. CO3- U (8)
- (ii) Write short note on MRI. CO3- U (8)
14. (a) With neat sketch explain how a Gamma-ray camera is used to detect and scan the gamma rays emitted from a patient who has been injected with a radio isotope. CO4- U (16)
- Or
- (b) Explain the principles of PET and SPECT with relevant sketch and clinical applications. CO4- U (16)
- 15 (a) Explain the 3DCRT and IMRT techniques in radiation therapy. CO5- U (16)
- Or
- (b) (i) Explain the functioning of Thermo Luminescent dosimeter. CO5- U (8)
- (ii) Briefly point out the ‘Radiation Protection in medicine’. CO5- U (8)