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**Question Paper Code: 56B01**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Sixth Semester

Biomedical Engineering

15UBM601- MEDICAL IMAGING EQUIPMENTS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- \_\_\_\_\_ is the practice of producing two-dimensional images using x-ray radiation CO1- R  
(a) Computed tomography (b) Projectional radiography  
(c) Fluoroscopy (d) Radiotherapy
- Mammography is used to examine the: CO1- U  
(a) Heart (b) Breast (c) Kidney (d) Lung
- A \_\_\_\_\_ is a device that narrows a beam of particles or waves. CO2- R  
(a) detector (b) collimator (c) electrode (d) CT tube
- North – East diagonal of the matrix CO2- U  
 $\begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$  is:  
(a)  $\begin{bmatrix} 12 & 6 \\ 9 & 15 \end{bmatrix}$  (b)  $\begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$  (c)  $\begin{bmatrix} 7 & 6 \\ 8 & 10 \end{bmatrix}$  (d)  $\begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$
- Magnetic resonance technique \_\_\_\_\_ CO3- U  
(a) NMR (b) CMRR (c) LASER (d) LDR
- The use of superconducting magnets in MRI is to obtain CO3- U  
(a) Signals from surface tissues (b) High R.F.field  
(c) High strength gradient fields (d) High strength magnetic field

7. Radioisotopes are isotopes of an element CO4- U  
 (a) radio (b) radioactive (c) radio-passive (d)infrared
8. During irradiation with X-rays, gamma rays and particle radiation, CO4- U  
 damage is caused to living cells because of \_\_\_\_\_ atoms and  
 molecules.  
 (a) Creation (b) Destruction (c) Scattering (d) Ionisation
9. The purpose of Radiation Therapy is \_\_\_\_\_. CO5- R  
 (a) To treat Benign tumors (b) To treat malignant tumors  
 (c) To treat swelling (d) To treat small intestine
10. Regulation is essential to control \_\_\_\_\_ exposure CO5- R  
 (a) skin radiation (b) medical radiation  
 (c) gamma radiation (d) X ray radiation

PART – B (5 x 2= 10 Marks)

11. Name few parts in the block diagram of X ray equipment. CO1- U
12. Give the applications of spiral CT scan. CO2- U
13. Give the principle of magnetic resonance signals CO3- U
14. Define gamma camera CO4- U
15. Write the clinical significance of cyber knife. CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain in detail the X ray equipment. CO1- U (16)  
 Or  
 (b) Write short notes on Digital Fluoroscopy. Angiography, cine CO1- U (16)  
 Angiography. Digital subtraction Angiography
17. (a) Describe the spiral CT scanning in detail. CO2- U (16)  
 Or  
 (b) (i) Explain the image reconstruction through back projection CO2- U (8)  
 technique.  
 (ii) Write short note on ultrafast CT scanners. CO2- U (8)
18. (a) Explain the block diagram approach of MRI system CO3- U (16)  
 Or

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|-----|---|--------|------|
| (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)  |
| 19. | (a) Explain in detail the radio detectors techniques.<br>Or                         | CO4- U | (16) |
|     | (b) Explain in detail the X-Y positioning circuit                                   | CO4- U | (16) |
| 20. | (a) E Explain the Recent Techniques in radiation therapy<br>Or                      | CO5- U | (16) |
|     | (b) (i) Explain the functioning of Thermo Luminescent dosimeter.                    | CO5- U | (8)  |
|     | (ii) Briefly point out the ‘Radiation Protection in medicine’.                      | CO5- U | (8)  |

