

Code No: 07A61104

**R07****Set No. 2**

III B.Tech II Semester Examinations, December 2010  
MEDICAL IMAGING TECHNIQUES  
Bio-Medical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. Explain the Fourier spectrum of the NMR signal with suitable figures. [16]
2. Discuss various X-Ray diagnostic methods with suitable examples. [16]
3. Compare the advantages and disadvantages of the four methods of pulse echo ultrasonic diagnostics. [16]
4. Discuss the nuclear particles and its nature of radioactivity decay. [16]
5. Define spatial resolution. Explain its significance in imaging. [16]
6. Write short notes on:
  - (a) Photo electric effect.
  - (b) Compton scattering
  - (c) Photodisintegration
  - (d) Roentgen and radiation absorbed dose. [4+4+4+4]
7. Write short notes on:
  - (a) Heart and muscle stimulation.
  - (b) Bone healing.
  - (c) magnetophosphenes. [5+5+6]
8. (a) Briefly explain the lateral resolution in terms of beam width. Justify with suitable figures.  
(b) Differentiate between the linear switched array and linear phased array. [8+8]

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**R07****Set No. 4**

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**MEDICAL IMAGING TECHNIQUES**  
**Bio-Medical Engineering**

**Time: 3 hours****Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Explain with the suitable example about ultrasonic texture and speckle reduction. [16]
2. Describe the rotation frame of reference and the RF magnetic field with suitable figures. [16]
3. Explain the various biological effects of ionizing radiation. [16]
4. Write short notes on:
  - (a) Scanning laser acoustic microscopy.
  - (b) Computed tomography.
  - (c) Doppler method.
  - (d) Duplex imaging. [4+4+4+4]
5. Explain the mean life time of the radioactive element and Define half life period of an isotope. [16]
6. Discuss the limitations of the conventional x-rays and the advantages of tomography and its existence. [16]
7. Write short notes on:
  - (a) Filament current.
  - (b) Image intensifier.
  - (c) X-ray film.
  - (d) Film magnification. [4+4+4+4]
8. Describe the effect of Radio frequency fields in MRI. [16]

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**R07**

**Set No. 1**

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**MEDICAL IMAGING TECHNIQUES**  
**Bio-Medical Engineering**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Explain in brief on Axial , lateral resolution and focusing arrays. [16]
2. Brief on Radon transform and its applications. [16]
3. Explain in detail with suitable figures on generation of X-Ray. [16]
4. (a) Discuss about the short term and long term effects of radiation on human body.  
(b) Briefly explain dosimeter and its uses. [8+8]
5. Discuss any four transmission methods of ultrasound. [16]
6. Write short notes on:  
(a) The magnet.  
(b) Superconducting magnet.  
(c) Permanent magnets. [5+6+5]
7. Discuss the characteristics of radionuclide images like spatial resolution, image contrast and image noise. [16]
8. Explain the image safety in MRI. [16]

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**Set No. 3**

**III B.Tech II Semester Examinations, December 2010**  
**MEDICAL IMAGING TECHNIQUES**  
**Bio-Medical Engineering**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Explain the spin-echo imaging in MRI with suitable pulse sequence figures. [16]
2. Discuss the basic fundamentals of Acoustic propagation and its medical uses. [16]
3. Explain in detail about Receiver operating curve(ROC)& image noise. [16]
4. Define white radiation and. Discuss the characteristics of radiation. [16]
5. Explain about interaction of nuclear particles and matter on alpha, beta and gamma particles with matter. [16]
6. Explain the principle of CT and the projection function with suitable mathematical expression. [16]
7. Define Doppler effect . Discuss on the continuous and pulsed Doppler methods and explain any one in detail with suitable figures. [16]
8. Briefly explain the shielded coils and how is the eddy current formation can be controlled with it for MRI. [16]

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