

**III B.Tech II Semester Supplementary Examinations,
November/December 2005
MEDICAL IMAGING TECHNIQUES
(Bio-Medical Engineering)**

Time: 3 hours

Max Marks: 80

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

1. What are the factors responsible for x-ray attenuation in matter ? Explain [16]
2. Mention the determinants of Biological effects? Describe the short term and long term effects of X-ray radiation? [16]
3. What is meant by Digital Radiography? What are the components involved in producing the images.Explain briefly. [16]
4. What are Ultrasound waves? How they are produced? Mention the uses? [16]
5. What are the different types of Biological effects observed with the usage of ultrasound? Give examples. [16]
6. List out some applications of Radioactivity in Medicine, Industry, Physics and Chemistry. [16]
7. Explain briefly the principles involved in Nuclear Magnetic Resonance Imaging. [16]
8. What are the biological effects of Magnetic Fields in Magnetic Resonance Imaging? [16]

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1. Write short notes on:
 - (a) The Compton effect
 - (b) The Coolidge tube
 - (c) Intensifying screens[16]
2. What do you mean by Mammography "and how the images are produced .Describe how it is useful in Medical diagnosis. [16]
3. Describe the uses of application of Computed Tomography. [16]
4. Write short notes on:
 - (a) Transducer
 - (b) Compensation of phase aberration
 - (c) Reflection and Refraction in acoustic propagation
 - (d) Attenuation and absorption in acoustic propagation.[16]
5. Discuss briefly Radiation hazards. [16]
6. Describe the properties of alpha, beta and gamma rays. [16]
7. Write short notes on:
 - (a) Spatial Resolution in MRI
 - (b) Image Contrast in MRI
 - (c) Magnetic Field Gradients in MRI
 - (d) NMR coil[16]
8. What are the biological effects of Magnetic Fields in Magnetic Resonance Imaging? [16]

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1. Write short notes on:
 - (a) X-ray tube Filters
 - (b) Grids
 - (c) X-ray detectors
 - (d) Beam Restrictors [16]
2. What is Xeroradiography and explain its mechanism in producing images for medical diagnosis. [16]
3. What is meant by Digital Radiography? What are the components involved in producing the images.Explain briefly. [16]
4. What are Ultrasound waves? How they are produced? Mention the uses? [16]
5. Discuss briefly Radiation hazards. [16]
6. Describe briefly the generation and detection of Nuclear Emission. [16]
7. Explain briefly the principles involved in Nuclear Magnetic Resonance Imaging. [16]
8. What are the biological effects of Magnetic Fields in Magnetic Resonance Imaging? [16]

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1. Write a short note on
 - (a) Auger effect
 - (b) Coherent scattering
 - (c) Fluorescent screens[16]
2. What are the biological effects of ionizing radiation like X-rays? What is mammography?[16]
3. What do you understand by the term Spatial Resolution? How is it significant in imaging ? Explain.[16]
4. Explain the fundamentals of Acoustic propagation?[16]
5. Discuss briefly Radiation hazards.[16]
6. Describe briefly the generation and detection of Nuclear Emission.[16]
7. Write short notes on:
 - (a) Spatial Resolution in MRI
 - (b) Image Contrast in MRI
 - (c) Magnetic Field Gradients in MRI
 - (d) NMR coil[16]
8. What are the different imaging methods available in Magnetic Resonance Imaging? Briefly describe them.[16]
