

Question Paper

Exam Date & Time: 05-Jan-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER M.Sc. (MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - JANUARY 2023
SUBJECT: MIT6101- ADVANCED INSTRUMENTATION AND TECHNIQUES IN ULTRASONOGRAPHY
(2021 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

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| 1) | Explain briefly the Quality Assurance & Control tests of ultrasound equipment. | (20) |
| 2) | Explain in detail Doppler spectral analysis & its display. | (20) |
| 3A) | Explain in detail Harmonic imaging and its significances in clinical imaging. | (10) |
| 3B) | Outline in detail the clinically significant of the Interaction of ultrasound with matter to produce a medical image. | (10) |
| 3C) | Explain the advancement in the design of ultrasound transducers. | (10) |
| 3D) | List the steps for Ophthalmic Ultrasonography. | (10) |
| 4A) | Outline Pulsed Doppler. | (5) |
| 4B) | List the techniques for Musculoskeletal Sonography. | (5) |
| 4C) | Classify Clinical Application of Contrast media in ultrasonography | (5) |
| 4D) | Define Beam Fomer. | (5) |

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Question Paper

Exam Date & Time: 07-Jan-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER M.Sc. (MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - JANUARY 2023
SUBJECT: MIT6102- NUCLEAR MEDICINE IMAGING TECHNIQUES
(2021 SCHEME)

Answer ALL questions.

Marks: 100

Duration: 180 mins.

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| 1) | Explain the basic principle of SPECT imaging in detail. Add a note on the application of SPECT | (20) |
| 2) | Explain about various electronic instrumentation for radiation detection system | (20) |
| 3A) | Explain the basic principle of cyclotron | (10) |
| 3B) | Explain the procedure for bone scintigraphy | (10) |
| 3C) | Outline various requirements for the transport of radioactive materials | (10) |
| 3D) | Explain ideal characteristics of radiopharmaceuticals | (10) |
| 4A) | Explain detector characteristics | (5) |
| 4B) | Explain basic principle of pulse-height spectrometry | (5) |
| 4C) | Explain the procedure I-131 therapy for hyperthyroid | (5) |
| 4D) | Outline steps involved in handling radioactive spills | (5) |

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Question Paper

Exam Date & Time: 09-Jan-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER M. Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - JANUARY 2023
SUBJECT: MIT6103 - ADVANCED INSTRUMENTATION AND TECHNIQUES IN MRI - II
(2021 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Explain the principle of MR spectroscopy, MR Perfusion. Discuss the types of MR Spectroscopy, MR Perfusion and its applications. Add a note on post-processing for MR spectroscopy and MR Perfusion. (20)
- 2) Discuss the Indications, Contraindications, Patient preparation, and Technique for MRI Breast. (20)
- 3A) Discuss in detail any five MR quality assurance tests and their tolerance limits. (10)
- 3B) Illustrate the MRI Female pelvis protocol. (10)
- 3C) Explain the technique of T1 cardiac mapping and its applications. (10)
- 3D) Explain the MRI Lung Protocol. (10)
- 4A) Compare In phase and Opposed Phase Imaging. (5)
- 4B) Explain the Interventional MRI suite. (5)
- 4C) List the Parameters affecting CNR in MRI. (5)
- 4D) Outline LAVA, LAVA Flex Sequence and its applications. (5)

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