

Question Paper

Exam Date & Time: 15-Feb-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc. (MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - FEBRUARY 2023
SUBJECT: MIT3101- PHYSICS OF ULTRASOUND
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Define resolution. Explain the various types of resolution and identify the factors affecting resolution. (20)
- 2) Explain the various display modes of ultrasound and their application (20)
- 3) Discuss the functioning of various components of transducer (10)
- 4) Explain Doppler effect, Doppler shift and Doppler angle. Add a note on Pulsed wave Doppler. (10)
- 5A) Explain basic principle of ultrasound (5)
- 5B) List the interaction of ultrasound with matter and explain reflection (5)
- 5C) Classify contrast agents used in ultrasound (5)
- 5D) Outline the safety requirements for clinical use of ultrasound (5)
- 5E) Write a short note on power doppler technique (5)
- 5F) List the various ultrasound artifacts. Explain ANY TWO. (5)
- 6A) Name the different types of Doppler techniques (2)
- 6B) Classify various types of transducers (2)
- 6C) List the types of piezoelectric crystal (2)
- 6D) What is the function TGC? (2)
- 6E) Define ultrasound (2)

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Question Paper

Exam Date & Time: 16-Feb-2023 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.(MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - FEBRUARY 2023
SUBJECT: MIT3102- COMPUTED TOMOGRAPHY - I
(2020 SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

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| 1) | Explain in detail about X-ray tubes used in CT. | (10) |
| 2) | Discuss in detail different types of reconstruction algorithms used in CT. | (10) |
| 3A) | Explain Slip ring technology | (5) |
| 3B) | Illustrate Electron beam CT | (5) |
| 3C) | Explain scintillation detectors. | (5) |
| 3D) | List the advantages of CT over other Imaging modalities. | (5) |
| 4A) | Define CT window width and window level | (2) |
| 4B) | List the advantages of CT control console. | (2) |
| 4C) | Classify types of detectors. | (2) |
| 4D) | List different types of data. | (2) |
| 4E) | List the functions of various components in CT. | (2) |

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Question Paper

Exam Date & Time: 17-Feb-2023 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.(MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - FEBRUARY 2023
SUBJECT: MIT3103- MAGNETIC RESONANCE IMAGING - I
(2020 SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

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|-----|--|------|
| 1) | Define SNR. Discuss the factors affecting SNR. | (10) |
| 2) | Explain MRI Personnel and MRI facility zones. | (10) |
| 3A) | Illustrate MRI patient preparation and how to make use of screening devices for patient and personal screening before entering MRI room. | (5) |
| 3B) | Explain T1 and T2 weighting in clinical MRI. | (5) |
| 3C) | Discuss different gradients and its directions with respect to bore of MRI machine. | (5) |
| 3D) | List the advantages and disadvantages of gradient echo pulse sequence. | (5) |
| 4A) | What is K-space ? | (2) |
| 4B) | Define CNR. | (2) |
| 4C) | What is Sampling ? | (2) |
| 4D) | Define MR active nuclei. | (2) |
| 4E) | Define Pulse sequence. | (2) |

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Question Paper

Exam Date & Time: 20-Feb-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc. (MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - FEBRUARY 2023
SUBJECT: MIT3104- SPECIALIZED IMAGING MODALITIES
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Explain the types of subtraction Techniques used in DSA (20)
- 2) Explain mammographic x ray tube in detail and Illustrate the characteristic x ray spectrum produced with various target -filter combination used in mammography (20)
- 3) Explain the Dental Anatomy and add a note on orthopantomography (10)
- 4) Explain the BIRADS classification in mammography and add a note screening mammography. (10)
- 5A) Explain Male mammography (5)
- 5B) Explain automatic exposure control (5)
- 5C) Illustrate instrumentation and clinical application of cephalostat (5)
- 5D) Define Digital Subtraction Angiography and write a note on accessories used in DSA (5)
- 5E) Define Mammography and Compare Screening and Diagnostic mammography (5)
- 5F) Explain the Instrumentation of DEXA (5)
- 6A) What are the complication of compression mammography? (2)
- 6B) Define cleavage view (2)
- 6C) Define DEXA with its clinical application (2)
- 6D) Define paralleling angle technique (2)
- 6E) Define bitewing technique (2)

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