

Question Paper

Exam Date & Time: 19-Jun-2024 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: BMIT-301- IMAGING PHYSICS AND DARKROOM TECHNIQUES (PART I)
(SCHEME 2016)

Marks: 50

Duration: 120 mins.

Answer all the questions.

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|----|--|------|
| 1) | Explain in details about the properties of X-ray. | (10) |
| 2) | Explain in detail about film construction. Add a note on film storage. | (10) |

Discuss the following:

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|-----|---|-----|
| 3A) | Types of intensifying screen | (5) |
| 3B) | Biological effect of Radiation | (5) |
| 3C) | Thermoluminescent dosimeter | (5) |
| 3D) | Characteristics of invisible X-ray image | (5) |
| 4A) | Terminology and notation of atom | (2) |
| 4B) | Exposure | (2) |
| 4C) | Luminescence | (2) |
| 4D) | Coherent scattering | (2) |
| 4E) | Difference between AC and DC power supply | (2) |

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Question Paper

Exam Date & Time: 20-Jun-2024 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: BMIT-309- RECENT TRENDS IN NUCLEAR MEDICINE TECHNOLOGY
(SCHEME 2016)

Marks: 50

Duration: 120 mins.

Answer all the questions.

Draw neat and labelled diagram as and when required.

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|-----|---|------|
| 1) | Discuss the principle and working of anger camera. | (10) |
| 2) | Discuss in detail about radiation safety in nuclear medicine. | (10) |
| 3A) | Write a note on bone scan. | (5) |
| 3B) | Write in detail working of gas-filled detectors. | (5) |
| 3C) | Write a note on radiopharmaceuticals used in PET imaging. | (5) |
| 3D) | Describe various methods used for determining decay factor. | (5) |
| 4A) | Define electron capture. | (2) |
| 4B) | Define activity. | (2) |
| 4C) | Define decay factor. | (2) |
| 4D) | What is transient equilibrium? | (2) |
| 4E) | Define step and shoot acquisition. | (2) |

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Question Paper

Exam Date & Time: 22-Jun-2024 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: MIT3101- PHYSICS OF ULTRASOUND
(SCHEME 2020)

Marks: 100

Duration: 180 mins.

Answer all the questions.

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|-----|--|------|
| 1) | Explain in detail the interactions of ultrasound with matter | (20) |
| 2) | Describe and classify the various contrast agents used in ultrasound imaging | (20) |
| 3) | Explain in detail about mechanical transducers used in ultrasound. | (10) |
| 4) | Discuss the appearance, cause and remedy of ultrasound artifacts | (10) |
| 5A) | Describe the types of resolution in ultrasound | (5) |
| 5B) | Explain the working of Continuous wave Doppler | (5) |
| 5C) | List the advantages and disadvantages of various display modes | (5) |
| 5D) | Illustrate Time gain compensation | (5) |
| 5E) | Explain the mechanical effects of ultrasound | (5) |
| 5F) | List the applications of Doppler in medical imaging | (5) |
| 6A) | Outline the basic principle of ultrasound | (2) |
| 6B) | Define Doppler shift and Doppler effect | (2) |
| 6C) | Define transducer Q factor | (2) |
| 6D) | Outline the significance of using coupling gel while ultrasound scanning | (2) |
| 6E) | Classify piezoelectric crystals with examples | (2) |

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Question Paper

Exam Date & Time: 24-Jun-2024 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: MIT3102- COMPUTED TOMOGRAPHY - I
(SCHEME 2020)

Marks: 50

Duration: 120 mins.

Answer all the questions.

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|-----|--|------|
| 1) | Explain in detail CT detector Technology. | (10) |
| 2) | Discuss in detail about CT principle. | (10) |
| 3A) | Explain Back Projection Reconstruction. | (5) |
| 3B) | List the advantages and disadvantages of third generation of the CT. | (5) |
| 3C) | Explain various components of computer system. | (5) |
| 3D) | Explain technical aspects of three-dimensional imaging in radiology. | (5) |
| 4A) | Define CT Control Panel. | (2) |
| 4B) | Define CT Window Level. | (2) |
| 4C) | List the characteristics of the detector. | (2) |
| 4D) | Outline advantages and disadvantages of Filtered Back Projection. | (2) |
| 4E) | List different types of data. | (2) |

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Question Paper

Exam Date & Time: 25-Jun-2024 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc.MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: MIT3103- MAGNETIC RESONANCE IMAGING - I
(SCHEME 2020)

Marks: 50

Duration: 120 mins.

Answer all the questions.

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|-----|--|------|
| 1) | Explain in detail about the various spin echo pulse sequences. | (10) |
| 2) | Define K-space and discuss the filling techniques of K-space. | (10) |
| 3A) | Describe the factors affecting SNR. | (5) |
| 3B) | Explain briefly the production of MR signal | (5) |
| 3C) | List the advantages and disadvantages of gradient echo pulse sequences | (5) |
| 3D) | Discuss patient care and safety precautions for patient during MRI. | (5) |
| 4A) | List the factors affecting scan time in MRI | (2) |
| 4B) | Define proton density weighting | (2) |
| 4C) | Define Magnetism and list the types of magnetism | (2) |
| 4D) | Define Free induction decay signal | (2) |
| 4E) | List the different pulse timing parameters in MRI. | (2) |

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Question Paper

Exam Date & Time: 21-Jun-2024 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER B.Sc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION-JUNE 2024
SUBJECT: MIT3104- SPECIALIZED IMAGING MODALITIES
(SCHEME 2020)

Marks: 100

Duration: 180 mins.

Answer all the questions.

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|-----|--|------|
| 1) | Explain anatomy of breast and add a note on basic view of mammography | (20) |
| 2) | Define Digital Subtraction Angiography and explain the Room layout and design of Digital subtraction Angiography | (20) |
| 3) | Explain the Instrumentation of DEXA | (10) |
| 4) | Explain the Dental Anatomy and add a note on periapical radiography | (10) |
| 5A) | Define Mammography and Compare Screening and Diagnostic mammography | (5) |
| 5B) | Illustrate automatic exposure control | (5) |
| 5C) | Explain pantomographic equipment | (5) |
| 5D) | Explain the room layout and design of DEXA | (5) |
| 5E) | Explain bitewing technique | (5) |
| 5F) | Illustrate the importance of compression and magnification techniques used in mammography | (5) |
| 6A) | Define Cephalometry | (2) |
| 6B) | Define BIRADS | (2) |
| 6C) | What is bisecting angle technique | (2) |
| 6D) | Define mask subtraction | (2) |
| 6E) | List the view taken form male mammography with two clinical indication | (2) |

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