Question Paper

Exam Date & Time: 07-Dec-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain Doppler effect, Doppler shift and Doppler angle. Add a note on working of pulsed wave doppler.	(20)
2)	Explain the mechanism for production of biological effects. Describe the safety requirements for clinical use of ultrasound.	(20)
3)	Explain the functioning of various components of transducer	(10)
4)	Classify Contrast agents used in ultrasound	(10)
5A)	Illustrate the appearance, cause and remedy of reverberation and mirror artifact	(5)
5B)	Describe piezoelectric crystals used in ultrasound imaging	(5)
5C)	Describe how sound beams are focused and scanned through anatomy	(5)
5D)	Explain how flow detection is localized using continuous wave doppler	(5)
5E)	Illustrate TGC control	(5)
5F)	Explain the reflection of ultrasound with matter	(5)
6A)	List the advantages of ultrasound	(2)
6B)	Compare the any two types of electronic probes	(2)
6C)	Define grey scale imaging	(2)
6D)	Define resolution	(2)
6E)	List the advantages and disadvantages of A mode	(2)

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Question Paper

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

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Discuss in detail the third generation of the CT. Add a note on Slip ring technology.	(10)
2)	Explain about Image reconstruction Algorithms.	(10)
3A)	Explain in detail about gas-filled detectors.	(5)
3B)	Explain the fundamentals of three-dimensional CT.	(5)
3C)	Explain in detail about fourth-generation CT scanner.	(5)
3D)	Explain the workflow during data acquisition.	(5)
4A)	Define window width and window level.	(2)
4B)	Outline the advantages of CT.	(2)
4C)	Define the different types of data.	(2)
4D)	List the disadvantages of the first generation of the CT.	(2)
4E)	List the functions of the various components in CT.	(2)

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Question Paper

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

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	List the intrinsic and extrinsic MRI contrast parameters. Demonstrate T1&T2 contrast mechanism in MR imaging.	(10)
2)	Define Pulse Sequence. Explain the formation, timing parameters and application of Spin echo in clinical imaging.	(10)
3A)	Discuss the use of different techniques to increase CNR.	(5)
3B)	Explain the mechanism and timing of the application of frequency encoding gradient during the pulse sequence.	(5)
3C)	Demonstrate the different options to fill k-space.	(5)
3D)	Illustrate the effect of application and withdrawal of RF pulse in MRI.	(5)
4A)	Outline the significance of SAR in MRI	(2)
4B)	State the Larmor equation.	(2)
4C)	Define Magnetism and list the various types of magnetism	(2)
4D)	Define MR active nuclei and give ANY TWO examples	(2)
4E)	Define Gradient and the types of gradients used in MRI	(2)

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Question Paper

Exam Date & Time: 14-Dec-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER BSc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - DECEMBER 2024
SUBJECT: MIT3104 - SPECIALIZED IMAGING MODALITIES
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain the room layout and design of digital subtraction angiography and outline the instrumentation of digital subtraction angiography and its working principle	(20)
2)	Explain the anatomy of breasts and outline the basic views of mammography	(20)
3)	Explain the dental anatomy and instrumentation of general dental radiography equipment	(10)
4)	Explain the Instrumentation of DEXA	(10)
5A)	Explain the BIRADS classification in mammography	(5)
5B)	Explain the types of subtraction techniques used in DSA	(5)
5C)	Explain periapical radiography	(5)
5D)	Explain the mammographic X-ray tube in detail	(5)
5E)	Outline the dental formula and illustrate various Dental terminologies	(5)
5F)	Explain the application and uses of DEXA	(5)
6A)	What are the complications of compression mammography	(2)
6B)	Define T- score and Z - score	(2)
6C)	Compare screening and diagnostic mammography	(2)
6D)	Define bitewing technique	(2)
6E)	Explain tangential view	(2)

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