



## BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – B.Sc.(MRIT)-2019/B.Sc.(MRIT)-2021

Course Name – Radiographic Techniques of Advanced Imaging Technology

Course Code - BMRIT503

( Semester V )

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) .....is defined as the property of materials that have no intrinsic atomic magnetic moment, but when placed in a magnetic field weakly repel the field, resulting in a small negative magnetic susceptibility.
  - a) Diamagnetism
  - b) Paramagnetic
  - c) Ferromagnetic
  - d) Magnetic field strength
- (ii) Which of the following measure the strength of an MRI Scanner?
  - a) MHU
  - b) Tesla
  - c) Slice
  - d) Frequency
- (iii) Slip ring technology is recognized with which of the following?
  - a) First generation
  - b) Second generation
  - c) Third generation
  - d) None of these
- (iv) Ring artifact was first observed in
  - a) First generation
  - b) Second generation
  - c) third generation
  - d) fourth generation
- (v) Which of the following used an electron gun instead of an x-ray tube?
  - a) CBCT
  - b) EBCT
  - c) DSCT
  - d) SSCT
- (vi) Radiation dose measurement in CT can be done with the help of
  - a) CTDI
  - b) DLP
  - c) Both 1 & 2
  - d) None of these
- (vii) TRUS is defined as a radiological examination which deals with
  - a) Ionizing radiation
  - b) Non-ionizing radiation
  - c) Particulate
  - d) Radionuclide

- (viii) Identify the limitation of the MRI scan
- a) Scan acquisition complexity
  - b) Long imaging time
  - c) Image artifacts
  - d) All of these
- (ix) Which of the following describes the basic principle of MRI?
- a) Placing the patient in the magnet
  - b) Sending radiofrequency (RF) pulse by the coil and Receiving signals from the patient by coil
  - c) Transformation of signals into images by complex processing in the computer
  - d) All of these
- (x) Hydrogen ion has only one particle, known as
- a) Proton
  - b) Electron
  - c) Neutron
  - d) Megatron
- (xi) Which of the following is associated with an ultrasound scan?
- a) TVS
  - b) TRUS
  - c) HIFU
  - d) All of these
- (xii) A sound wave can be described by
- a) Wavelength & Amplitude
  - b) Time-Period & Frequency
  - c) Velocity or speed
  - d) All of these
- (xiii) The frequency of sound is measured in
- a) Hz
  - b) Tesla
  - c) CM
  - d) Meter
- (xiv) Select the correct statement related to hydrogen protons used in MRI Scan
- a) Presently MR imaging is based on proton
  - b) Without any influence of the external magnetic field, protons randomly move in the body in any direction.
  - c) Both 1 & 2
  - d) None of these
- (xv) Identify the incorrect statement about ultrasound
- a) Refers to sound waves that are not detectable by the human ear with frequencies greater than 20,000 cycles/sec (Hz)
  - b) It is a form of mechanical energy which can be characterized as some wave phenomena
  - c) An ultrasound is not similar to an x-ray as both are wave-transmitting energy
  - d) The velocity of sound is depending on the nature of the medium

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain USG Transducer with a diagram. (3)
  3. Write a short note on NCCT Abdomen. (3)
  4. What is Ultrasonography? (3)
  5. What is duplex scanning in Doppler? (3)
  6. Distinguish between spin echo and gradient echo pulse sequence. (3)
- OR**
- Explain the spin echo pulse sequence. (3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain piezoelectricity and its application in diagnostic radiology. (5)
8. Illustrate the term MRS. (5)

9. Explain common indications, contraindications, and risk factors of MRI. (5)
10. Write a brief note on the Data acquisition process in USG. (5)
11. Distinguish between A-Mode and B-Mode USG with their application. (5)
12. Briefly explain the CDFI with its application in diagnostic radiology. (5)

**OR**

Illustrate the terms Transduce with diagram. (5)

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