



BRAINWARE UNIVERSITY

Term End Examination 2022

Programme – B.Sc.(MRIT)-2020

Course Name – Physics of Advanced Imaging Technology

Course Code - BMRIT502

(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) Choose for which of these areas can the ultrasound be taken for an infant but not for an adult?
 - a) Cranium
 - b) Chest
 - c) Arms
 - d) Legs
- (ii) When an abdominal ultrasound is done, justify why is it advised to have a full bladder?
 - a) To have a good acoustic window
 - b) To increase the water content
 - c) To lower impedance
 - d) To allow for better propagation of waves
- (iii) These days , piezoelectric crystal material is originate with
 - a) Phosphor
 - b) Bismuth Zirconate
 - c) Lead Zirconate Titanate
 - d) All of these
- (iv) Justify which has the greatest amount of attenuation?
 - a) Water
 - b) Bone
 - c) Muscle
 - d) Fat
- (v) Identify Spatial resolution in CT is
 - a) 1 lp mm⁻¹
 - b) 2 lp mm⁻¹
 - c) 4 lp mm⁻¹
 - d) 10 lp mm⁻¹
- (vi) Generalize CT fluoroscopy minimizes radiation doses by using
 - a) Filtration
 - b) High tube current
 - c) Lower collimator thickness
 - d) Low tube current
- (vii) Define Slice acquisition rate?
 - a) Couch movement each 360 degreee divided by slice thickness.
 - b) Couch movement each 360 degree multiplied by slice thickness
 - c) Couch movement each 360 degree added by slice thickness
 - d) None of these
- (viii) Select the range of CT number above and below the window level is called the
 - a) Window level
 - b) Window width
 - c) Window slice
 - d) All of these
- (ix) Describe Cardiac gating is used for minimizing

- a) Motion artifact
 - b) Ring artifact
 - c) Beam hardening effect
 - d) Photon starvation effect
- (x) Show the correct option : Beam hardening effect can be avoided by ?
- a) Tilting the gantry
 - b) Means of sedation
 - c) Using as short scan time as possible
 - d) None of these
- (xi) Complete the sentence, In MRI if we increase the slice thickness, SNR will be....
- a) Higher
 - b) Lower
 - c) No change
 - d) Cannot be determined
- (xii) Report he commonly used MRI's have a magnetic strength of _____
- a) 1.5 -3 Tesla
 - b) 3 - 6 Tesla
 - c) 6 -12 Tesla
 - d) 12 - 24 Tesla
- (xiii) If the XY grid is selected in MRI then the slice selection is applied in which plane?
- a) X plane
 - b) Â Y plane
 - c) Z plane
 - d) XY plane
- (xiv) Conclude MRI room shielding also called as ?
- a) Faradays Cage
 - b) Birds Cage
 - c) Newtons Cage
 - d) Einsteins Cage
- (xv) Correlate If we increase the slice thickness, SNR will ?
- a) Higher
 - b) Lower
 - c) No change
 - d) Cannot be determined

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Write MRCP procedure in detail? (3)
- 3. Write a notes on Transducer? (3)
- 4. Explain MIP & SSD (3)
- 5. Write USG Display Modes? (3)
- 6. Write the components of MRI in detail? (3)

OR

What is a magnet and types of magnet used in MRI? (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Explain DWI sequence? (5)
- 8. Explain Gradient coil in detail. (5)
- 9. Write in detail on Modes and Array of USG? (5)
- 10. Explain CT image reconstruction. (5)
- 11. Explain the basic Principle of MRI? (5)
- 12. Explain CECT chest and the contrast used? (5)

OR

Describe the protocol for CECT Neck? (5)
