N. A

BRAINWARE UNIVERSITY

Term End Examination 2023
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) Express Ultrasound' is a reflection of
   a) soft tissues only b) hard tissues only
   c) both soft and hard tissues d) hard muscles only

(ii) Select which property of sound waves acts like the principle of ultrasound?
   a) Reflection and Refraction b) Reflection only
   c) Refraction only d) Propagation

(iii) Express Piezoelectric effect
   a) Application of magnetic field causes change in physical dimension b) Application of electric field causes change in physical dimension
   c) Application of either electric or magnetic field causes change in physical dimension d) None of these

(iv) Recoganized range of low frequency ultrasound ?
   a) 5-7MHz b) 8-9MHz
   c) 8-10MHz d) 8-15MHz

(v) Describe Contrast resolution in CT is
   a) Better than conventional films b) Less than conventional films
   c) Same as conventional films d) None of these

(vi) Name the tube used in CT scan
   a) Rotating anode tube b) Stationary anode tube
   c) Gassy tube d) None of these

(vii) Name the artifact showing Star artifact in CT scan is due to
   a) Patient movement b) Aliasing
   c) Beam hardening d) Metals in the body

(viii) Select the correct option:In currently available CT scanner, K has a value of
   a) 100 b) 1000
   c) 10000 d) 1000000

(ix) Identify Spiral CT scanner was made possible by the use of

a) Multiple row detector
b) Array processor
c) Light weight of X-ray tube
d) Slip ring technology

(x) Select he numeric information contained in each pixel is called

a) CT number
b) Intensity
c) Attenuation coefficient
d) Density

(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) Relate the cooling agent for the MRI magnet is _____

a) Helium
b) Neon
c) Argon
d) Xenon

(xiii) Choose the smallest unit in the reconstruction/projection of an MRI image is called as _____

a) pixel
b) voxel
c) binary unit
d) dot

(xiv) Conclude the primary MR signal is called ?

a) Transverse magnetization
b) Longitudinal magnetization
c) Spin density
d) Free inductance decay

(xv) Correlate If we reduce FOV, image resolution will.... And voxel size will reduce ?

a) Increase
b) Decrease
c) Will not very
d) Become unpredictable

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Write the different types of Doppler ultrasound mode (3)
3. Explain the uses of Gradient in MRI? (3)
4. Explain different types MRI Artifacts ? (3)
5. Explain Turbo spin echo sequence? (3)
6. Explain MDCT (Multidetector CT scan)? (3)

OR

Describe briefly about the Helical CT? (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain MR Spectroscopy ? (5)
8. Write MR Hardware in detail. (5)
9. Explain different generations CT scan with its diagram (5)
10. What is Doppler Effect? Express in details about the different types of Doppler mode with its application (5)
11. Discuss the protocols for CT Angiography (5)
12. Write in detail on MRI sequence. (5)

OR

Explain Turbo spin echo sequence. (5)

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