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BRAINWARE UNIVERSITY

Term End Examination 2023 Programme – B.Sc.(MRIT)-2019/B.Sc.(MRIT)-2020 Course Name – Physics of Newer Imaging Modalities Course Code - BMRIT401 (Semester IV)

Full Marks: 60

[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) Select the correct option: what type of beam is used by 5th generation CT Scan? a) Multiple X-ray beam b) Broad fan beam c) Narrow Fan Beam d) Pencil beam of X-rays (ii) What kind of diagnostic test is done if a screening mammogram shows an area that needs closer examination? a) MRI b) Diagnostic mammogram c) Total body X-ray d) EEG (iii) Select the correct option: What is a Pitch? a) Couch movement each 360 degree added b) Couch movement each 360 degree by slice thickness Multiplied by slice thickness c) Couch movement each 360 degree divided d) None of these by slice thickness (iv) The Digital radiography differs from computed radiography in....... Complete the sentence. a) Reduced radiation exposure b) Digitization of image d) Reduced retakes c) Combined image capture and readout capability (v) Represent an Image transmission within a hospital happens via the _____. a) Internet b) Intranet c) Ethernet d) None of these (vi) Indicate Fluorography typically...

a) produces images of far inferior quality to fluoroscopy b) refers to a continuous x-ray exposure technique

c) results in dose rates which are much less than in fluoroscopy d) uses dose rates 10-50 times greater than in fluoroscopy

(vii) Identify the atomic number of Bismuth is.........
a) 83 b) 4
c) 74 d) 131

(viii)	Choose the correct option: When T1 is approx magnetization is reached.	of original longitudinal	
	a) 0.37	b) 0.63	
/iv/	c) 0.5	d) 1	
(IX)	Select the element used as a filter in mammogra	•	
	a) Molybdenum c) Any of these	b) Rhodium	
(x)	Relate which magnets require the use of cryoge	d) None of These ns	
	a) Bar	b) Resistive	
	c) Superconducting	d) Permanent	
(xi)	Complete the sentence: the heel effect is caused	d by	
	 a) different path lengths of photons in the anode — the correct answer 	b) misaligned collimation	
,	c) operating the x-ray tube with the beam horizontal	d) placing wedge filters in the x-ray bear	n
(XII)	Choose the correct option: Thalium doped cesiu		
	a) photoscintillator	b) Photo-conductor	
(xiii)	c) Photostimulable phosphor lodine has a half life of Complete the se	d) Protective layer	
,····,	a) 6 hr	b) 8.06 days	
	c) 128 days	d) 23 hr	
(xiv)	Identify Image reconstruction was evaluated Ma		
	a) Wilhelm Cornard Roentgen	b) Alan Cormack	
(xv)	c) Godfrey Hounsfield Select the energy level used in mammography is	d) None of these	
	a) Low energy	b) High energy	
	c) Very high energy	d) None of these	
	Grou		
	(Short Answer Ty	pe Questions)	3 x 5=15
2. Explain shimming and its types, Quenching and k-Space?			(3)
	3. Determine the Instrumentation of CT Scan?		
	4. Express the list some commonly used radioisotope? 5. Difference between CR and DR system?		
	5. Evaluate what are the characteristics of DR?		
	OR		(3)
Ex	press how does a CR System work?		(3)
	Grou		
	(Long Answer Ty	pe Questions)	5 x 6=30
7. [Define magnet used in MRI and types of magnet?	,	(5)
	3. Illustrate DEXA equipmentation with its principle?		
9. Explain the working principle of DEXA scan?			(5)
10. What are magnets? Types of magnet? What causes the noise in the scanner? Explain using your concept?			g (5)
	explain what is the basic principle of DSA?		(E)
	explain Computed Radiography reader?		(5) (5)
	OR		(-)
Classify the three primary stages of Computerized Radiography System? (5)			