U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: Medical Electronics Engineering **Duration: 3 hrs.**

Course Code: 23MD5PCMIM / 22MD5PCMIM **Max Marks: 100**

Course: Medical Imaging Modalities

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	List out all the need for modalities and multimodalities for medical applications?	CO1	PO 2	**05**
	b)	Explain the process involved in X-ray imaging. Digital subtraction angiography (DSA) with relevant diagram.	CO1	PO2	**10**
	c)	Explain the history on discovering X-Ray leading to Medical Application	CO1	PO2	**05**
		OR			
2	a)	Explain the basic Scientific principle involved in X-ray with a relevant diagram	CO1	PO2	**10**
	b)	List and explain the clinical applications of X-ray Imaging.	CO1	PO2	**10**
		UNIT - II			
3	a)	Define the following wrt CT imaging radiation dose a. CTDI and its unit b. DLP and its unit c. Effective dose and its unit	CO2	PO2	**10**
	b)	Explain the Computed Tomography Maximum Intensity projection reconstruction techniques for medical applications.	CO2	PO2	**10**
		OR			
4	a)	Explain the evolution of CT scanners from single source scanner to dual source scanner?	CO2	PO2	**10**
	b)	How do contrast agents, such as Barium and Iodine, enhance the performance of CT scans?	CO2	PO2	**10**

			UNIT - III			
	5	a)	Explain the relationship between frequency and wavelength in ultrasound.	*CO3*	*PO3*	**10**
		b)	Examine the fundamental concepts of reflection, refraction, and attenuation in the context of diagnostic ultrasound imaging.	*CO3*	*PO3*	**10**
			OR			
	6	a)	Discuss the phenomena of Posterior Enhancement and Posterior Shadowing in B-Mode ultrasound imaging.	*CO3*	*PO3*	**10**
		b)	Explain the Doppler Effect in ultrasound and elucidate the fundamental principles behind it.	*CO3*	*PO3*	**10**
			UNIT - IV			
	7	a)	Explain the Scientific principle of MRI.	*CO3*	*PO3*	**10**
		b)	Explain the properties of Fourier transform applied to MRI	*CO3*	*PO3*	**10**
			OR			
	8	a)	List and explain the Clinical application of MRI.	*CO3*	*PO3*	**10**
		b)	Write a note on functional MRI	*CO3*	*PO3*	**10**
			UNIT - V			
	9	a)	Explain the basic principle of Diagnostic nuclear medicine.	*CO2*	*PO2*	**10**
		b)	Write a note on 1.SPECT 2.PET	*CO2*	*PO2*	**10**
			OR			
	10	a)	Explain the concept of PET image reconstruction.	*CO2*	*PO2*	**10**
		b)	Explain attenuation correction using in imaging	*CO2*	*PO2*	**10**

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