

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

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Branch: Institutional Elective

Course Code: 19ML7OE2IM

Course: Imaging Modalities

Semester: VII

Duration: 3 hrs.

Max Marks: 100

Date: 22.02.2023

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

UNIT - I

- 1 a) Classify the different interactions between X-ray and matter. Explain any two in detail. **10**
- b) Provide detail information about Dual-Energy imaging. **05**
- c) Discuss any one clinical application of x-ray imaging. **05**

OR

- 2 a) Elaborate on the basic principle of the "Angiography" imaging technique. Discuss its applications. **10**
- b) With a neat block diagram, discuss the functions of the major components of Digital Subtraction Angiography system. What are the advantages and limitations of a DSA over film subtraction angiography? **10**

UNIT - II

- 3 a) Discuss the clinical applications of Computed Tomography. **05**
- b) What is a CT number? Give its significance in CT imaging. **05**
- c) Briefly summarize the Detectors for Computed Tomography. **10**

UNIT - III

- 4 a) List the types of clinical applications of ultrasound. Narrate any one of them. **07**
- b) Explain the term Attenuation, Absorption and scattering with respect to ultrasound. **08**
- c) Provide information about blood velocity measurements using ultrasound. **05**

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 - IV

- 5 a) Discuss some of the fundamental concepts of frequency and phase encoding imaging methods of MRI. **10**
- b) Explain the Spin-Echo imaging sequence with respect to MRI. **10**

OR

- 6 a) List the clinical applications of MRI. Explain any one of them. **07**
- b) Provide information about MRI contrast agent. **07**
- c) Discuss briefly about the safety issues to be considered in MR Imaging. **06**

UNIT - V

- 7 a) Discuss briefly PET image reconstruction. **05**
- b) With schematic diagram explain electronic processing of Gamma camera. **08**
- c) Mention and explain any one different test performed using radiation detector probe in diagnostic methods of radio nuclide imaging. **07**
