

CBCS SCHEME

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18EI821

Eighth Semester B.E. Degree Examination, July/August 2022 Medical Imaging Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the five ways of interaction between X-rays with atoms. (10 Marks)
b. Explain the basic construction of an X-ray tube. What are the factors that affect the intensity of the X-ray beam? (10 Marks)

OR

- 2 a. Explain the following:
i) Fluoroscopy
ii) Angiography
iii) Mammography
iv) Computed Tomography. (10 Marks)
b. Explain the biological effects of ionizing radiation. (10 Marks)

Module-2

- 3 a. Explain the construction, network model, equivalent circuit and frequency response of single element ultrasonic transducer. (10 Marks)
b. Explain attenuation, absorption and scattering in ultrasonic wave propagation. (10 Marks)

OR

- 4 a. Draw the block diagram of A mode pulse-echo system and explain its working. What are its applications? (10 Marks)
b. What is Doppler effect and Doppler frequency? Explain the working of CW ultrasonic flow meter. (10 Marks)

Module-3

- 5 a. Explain the terms:
i) Nuclear particles
ii) Nuclear activity and half life
iii) Units of measuring nuclear activity. (10 Marks)
b. List the types of nuclear radiation detectors. Explain any one with a schematic diagram. (10 Marks)

OR

- 6 a. Explain the applications of radiation detector probes in clinical diagnosis. (10 Marks)
b. Explain the principle and working of Positron Emission Tomography. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain:
- i) Angular momentum
 - ii) Free induction decay. (10 Marks)
- b. With a neat block diagram, explain the working of magnetic resonance imaging system. (10 Marks)

OR

- 8 a. Discuss slice selection, phase encoding and frequency encoding in NMR imaging. (10 Marks)
- b. Explain the characteristics of magnetic resonance images. (10 Marks)

Module-5

- 9 a. Explain the physical factors that affect the amount of infrared radiation. (07 Marks)
- b. Explain the components of infrared image scanner with a neat schematic block diagram. (13 Marks)

OR

- 10 a. Explain the working of pyroelectric vidicon camera with a neat schematic block diagram. (12 Marks)
- b. Explain the salient features of image guided interventions indicating its advantages and applications. (08 Marks)
