

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2170303****Date: 15/11/2018****Subject Name: Medical Imaging techniques****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Why is tungsten used as a target material in X-ray tube? **03**
(b) Write the comparisons between fluoroscopy and radiography. **04**
(c) Explain in detail the fundamental interactions between x-rays and matter. **07**

- Q.2** (a) Define the characteristic x-rays. **03**
(b) Draw and Explain the electrical circuit of X ray generator. **04**
(c) What is an image intensifier tube? Draw and explain the construction and working of image intensifier tube. **07**

OR

- (c) Explain functions of beam restrictor. Draw and explain collimator. **07**

- Q.3** (a) State and explain Clinical applications of Thermography. **03**
(b) Draw and explain xeroradiography. **04**
(c) Write a note on nuclear radiation detectors. **07**

OR

- Q.3** (a) What is piezoelectric effect? Give the example of piezoelectric material. **03**
(b) Explain Gamma camera in detail. **04**
(c) Write a detail note on SPECT. **07**

- Q.4** (a) Describe the characteristics of ultrasound wave. **03**
(b) What types of detectors are used in thermal imaging system? Explain the infrared detector in detail. **04**
(c) Explain in detail spatial encoding for MRI study. **07**

OR

- Q.4** (a) What are the basic components in NMR imaging? **03**
(b) Explain T1 relaxation time in context of MRI. **04**
(c) Write a note on the generation of CT scanner. **07**

- Q.5 (a) Explain why array structure is better in ultrasound transducer design. **03**
(b) Describe the biological effects of ultrasound imaging techniques. **04**
(c) Give detailed characteristics of ultrasound transducer beam design. **07**

OR

- Q.5 (a) Explain propagation of ultrasound wave with necessary schematic. **03**
(b) What is Thermal Imaging? Explain Infrared Thermography in detail. **04**
(c) Explain A-mode scan of Ultrasonic Imaging system **07**

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