Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**ME - SEMESTER– II (Old course) • EXAMINATION (Remedial) – WINTER- 2015**

**Subject Code: 1723102** **Date: 10/12/2015**

**Subject Name: Advanced biomedical imaging**

**Time:2:30 pm to 5:00 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)** Explain following terms related to X-ray imaging: **07**

- focal spot size
- atomic number
- tube current
- Bremsstrahlung radiation

**(b)** Write a short note on **07**

- Intensifying Screens and
- X-Ray Film

**Q.2** **(a)** Write an introductory note on necessary image processing for computed tomography. **07**

**(b)** Explain few applications of computed tomography in details. **07**

OR

**(b)** Explain multi slice spiral computed tomography. **07**

**Q.3** **(a)** Draw and explain basic instrumentation of Single Photon Emission Computed tomography. **07**

**(b)** Explain the principle of annihilation coincidence detection with necessary schematic. **07**

**OR**

**Q.3** **(a)** Explain generalized principle of Positron emission tomography. Enlist radionuclides used for PET. **07**

**(b)** Enlist applications of PET and SPECT in medical field. **07**

**Q.4** **(a)** Explain following terms related to Ultrasound imaging **07**

- Acoustic Impedance
- Axial and Lateral Resolution
- Time Gain compensation
- Doppler effect

**(b)** Write a short note on different types of coils used in MRI. **07**

**OR**

**Q.4** **(a)** Compare all diagnostic mode of ultrasound imaging system. **07**

**(b)** Explain basic working concept of MRI. What is the need of RF pulse in MRI? **07**

**Q.5** **(a)** Write a short note on Functional Magnetic Resonance Imaging. **07**

**(b)** Explain applications of Magnetic Particle Imaging in details. **07**

**OR**

**Q.5** **(a)** Explain imaging concept of thermal imaging techniques with applications. **07**

**(b)** Explain role of Nano scale imaging in medical field. **07**

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