

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

Subject code: 2713108**Date: 07-01-2015****Subject Name: Medical Instrumentation and Systems****Time: 02:30 pm - 05:00 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) Design current to voltage converters. How sensitivity of I to V converter can be improve? **07**
- (b) Derive equation of gain for instrumentation amplifier and why it is preferable for biomedical applications? **07**
- Q.2** (a) Give short note on various Electrical safety issues in medical devices. **07**
- (b) Draw circuit of KRC low pass filter and Derive equation of Gain. **07**
- OR**
- (b) Find the equivalent impedance of a Generalized impedance converter toward ground. Draw circuits of Inductor simulator and D element realization. **07**
- Q.3** (a) Explain designing of Switched capacitor filters. **07**
- (b) Give description about transient response of OPAMP. **07**
- OR**
- Q.3** (a) Derive the equation of errors caused by input bias and offset current in op-amp. **07**
- (b) Derive the equation of errors caused by input offset voltage and thermal drift in op-amp. **07**
- Q.4** (a) Design 4 bit switched current source type DAC. Range of output voltage is 0 to 5 volt. **07**
- (b) Explain working of R-2R ladder type DAC. **07**
- OR**
- Q.4** (a) Design 3 bit flash type Analog to Digital converter for analog input 0 to 8 volt. **07**
- (b) Explain two-noise source model for a noisy amplifiers **07**
- Q.5** (a) Draw and explain the noise equivalent circuit for the BJT amplifier. **07**
- (b) What is the need of isolation amplifier in body parameter acquisition? And explain any one type of medical isolation. **07**
- OR**
- Q.5** (a) Explain architecture of phase lock loop and their biomedical application. **07**
- (b) Explain balanced bridge diode type and electro mechanical chopper phase sensitive type phase sensitive rectifier circuits. **07**
