

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013**

**Subject code: 713102N****Date: 04-06-2013****Subject Name: Biosensors and Biomems****Time: 10.30 am – 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) Design rectifier and filter for 20V/2A regulated power supply using transistor as series pass element with short circuit protection. 14
- Q.2 (a) Write a short note on RTD for temperature measurement. Design a signal conditioning circuit for temperature measurement using RTD. 07
- (b) Draw and explain the signal conditioning circuit of LVDT. Explain how SPSD can be used in this circuit. 07
- OR**
- (b) Write a short note on thermistor and explain how it can be used for temperature measurement using proper signal conditioning circuit. 07
- Q.3 (a) Explain the necessity of temperature compensation in load cell. How it can be implemented? 07
- (b) Write a short note on vortex shedding flow meters. 07
- OR**
- Q.3 (a) Write a short note on torque measurement using strain gauge 07
- (b) Write a short note on Electromagnetic flow meters. 07
- Q.4 (a) Explain the measurement of liquid conductivity in detail. 07
- (b) Write a short note on BioMEMS in diagnostic applications. 07
- OR**
- Q.4 (a) Write a short note tactile sensors. Explain its use in biomedical applications. 07
- (b) Write a short note on MEMS in surgical applications. 07
- Q.5 (a) Explain the sensor classification in detail. 07
- (b) Briefly discuss different surface processing techniques in MEMS devices. 07
- OR**
- Q.5 (a) Write a short note on instrumentation amplifiers. 07
- (b) Write a short note on smart sensors. 07
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