

APJ Abdul Kalam Technological University
Second Semester M. Tech Degree Examination May 2016

Ernakulam II Cluster

Branch: Electronics and Communication Engineering

Specialization: VLSI and Embedded Systems

Time: 3 hrs.

05EC 6004- SENSOR TECHNOLOGIES AND MEMS

Max. Marks: 60

1.
 - a. State the relevance of different criteria for the selection of transducers for a particular application. (6 Marks)
 - b. Describe the working and construction of Resistance thermometer. Describe the materials used for RTD, along with their properties. Sketch their typical characteristics. (6 Marks)
2.
 - a. Write a short note on the construction and principle of working of a LVDT. Explain how the magnitude and direction of the displacement of core of an LVDT detected. (6 Marks)
 - b. With neat sketches give a brief note on the following primary detecting elements.
 - i. Bourdon tubes
 - ii. Bellows
 - iii. Diaphragms (6 Marks)
3.
 - a. Explain the Thermoelectric phenomena and how a temperature measuring system can be built. (6 Marks)

- b. Explain the Piezoelectric phenomena and show how the crystal is suitable for force and pressure measurement. (12 Marks)

OR

4.

- a. Give a detailed account on the steps of processing the production of thick film sensors. What are the substrates and initial base materials used in the process? (6 Marks)
- b. Bring the major processing steps in developing the standard semiconductor micro-sensor technology. Describe with suitable diagram. (12 Marks)

5.

- a. Analyse any two methods of digital to analog conversion. (6 Marks)
- b. How shielding and grounding will affect the signal acquisition and explain the different methods. (12 Marks)

OR

6.

- a. State the significance of instrumentation and isolation amplifiers. (6 Marks)
- b. Design an AC bridge circuit to process the capacitive variation obtained from the transducer. What are the design conditions? (12 Marks)