

B

APJ Abdul Kalam Technological University

Ernakulam II Cluster

Second Semester M. Tech Degree Examination April 2018

05EC6004 - SENSOR TECHNOLOGIES AND MEMS

Time: 3 hrs.

Max. Marks: 60

1.
 - a. What are the static characteristics for the selection of transducers for a particular measurement? (6 Marks)
 - b. Design a liquid level measurement system using a potentiometer and control the on and off of valve when the tank is empty and full. Give the block schematic. (6 Marks)

2.
 - a. With the basic principle of operation and applications, explain the following transducers.
 - i. Diaphragm
 - ii. bourdon tube (4 Marks)
 - b. Design a fully automated embedded system to measure the weight of cloths in a washing machine using LVDT. Define the features of the system. Design the block schematic, circuit diagram and other design aspects. (8 Marks)

3.
 - a. What is the basic principle of humidity sensors? Give a typical application. (6 Marks)
 - b. Expound the photovoltaic transducer and design an automatic street light system. (12 Marks)

OR

4.
 - a. Based on the principle of operation, construction, theory, advantages and disadvantages and applications, explain the following transducers.

- i. Digital transducer
- ii. Smart sensors (6 Marks)

- b. Design an automatic street light system using a photo conductive transducer. Give the block schematics of the system and explain. (12 Marks)
- 5.
- a. Evaluate any method of analog to digital conversion. (6 Marks)
 - b. By what method shielding and grounding will affect the signal acquisition and explain the different methods of shielding. (12 Marks)

OR

- 6.
- a. Design an ac bridge signal processing circuit to measure the variations produced in a capacitive transducer. What are the design conditions? (9 Marks)
 - b. Design the block schematics of an isolation amplifier. Explain the relevance of each block. (9 Marks)