Reg. No. | | | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

SIXTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER DEGREE EXAMINATION, JUNE - 2019

SUBJECT: ADVANCED SENSOR TECHNOLOGY [ICE 4009]

TIME: 3 HOURS MAX. MARKS: 50

Instructions to candidates :*Answer ALL questions and missing data may be suitably assumed.*

1A List the different representation for inaccuracy rating of a sensor

1B What are the shortcomings of conventional sensors?

1C Explain temperature measurement using optical devices. Indicate the assumptions and parameters effecting the measurement.

(2+3+5)

2A Define the principle of magnetic mass flow meter. List its drawbacks.

2B List and explain the different emissions used in optical sensing

2C With a neat diagram explain the working of capacitive accelerometer. Specify how to convert a single axis accelerometer to a three dimensional accelerometer.

(2+3+5)

3A Define villari and Joule effect, and indicate any one application of each as sensors

3B Platinum RTD produces a resistance change in resistance of 38 ohms for variation in temperature from 0 to 100 ^{o}C. Suggests a suitable circuit to produces a voltage of 0 to 5V.

3C Design a capacitive sensor to measure angular displacement of 0 to 90^{o} range.

(3+3+4)

4A What is the principle of eddy current sensors? Explain any one application.

4B Explain the working of catalytic sensor, with an example.

4C Differentiate direct and indirect chemical sensing.

(4+3+3)

5A How a SAW sensor can be used for measurement of humidity?

5B What are enzyme biosensors? Discuss with an application

5C With the design of T-type microfluidic sensor, explain the flow measurement.

(4+3+3)

****