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, APRIL/MAY - 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 Classify sensors based on responses to stimulus.

1B Sensitivity of a sensor is related to resolution and linearity. Justify

1C Explain the working of mach-zehnder interferometer based pressure sensor. Indicate the different parameters related to the measurement.

(2+3+5)

2A List the techniques which can be incorporated to increase sensitivity of strain gauges

2B How does grating influence the measurement using optical techniques?

2C What is the need for force balance type accelerometer? Explain its principle and working.

(2+3+5)

3A With the phasor diagram, define the principle of magnetoresistive sensors.

3B LVDT is used for displacement measurement in the range 0 to 10mm. What changes need to be incorporated in LVDT to produces the same output for the range of 0 to 5mm.

3C Derive and compare the expression for sensitivity of parallel plate and cylindrical capacitance level sensors.

(2+3+5)

4A Describe the fault detection techniques employed on gear trains.

4B Explain the working of metal oxide sensor used to measure concentration of ethanol

4C How opto-chemical principles can be used for pH measurement?

(4+3+3)

5A List the different types of membranes used in potentiometric chemical sensors.

5B With an application describe the working of antibody as a biosensor.

5C Explain the process of fabricating a microfluidic flow sensor.

(2+4+4)

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