Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: SENSOR TECHNOLOGY [ICE-3284]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed

1A. The requirements of the measurement of a given environment determines the choice of a sensor. How can one quantify the requirements of such measurements? **4**

1B. Provide a brief note on the following static characteristics of sensor: **3**

(a) Repeatability

(b) Reliability

1C. Briefly explain the need for measurement standards. **3**

2A. With relevant diagram, discuss briefly on the working principle of typical ultrasonic based flow sensor. Also, list the advantages and disadvantages of using such flow sensors (at least TWO). **4**

2B. Write a short note on: **6**

(a) Sensing technique adopted for high-viscosity, low-velocity fluid-flow.

(b) RTD

(c) Pyroelectric crystal

3A. State and explain Thomson effect. **2**

3B. Differentiate between: **4**

(a) Piezo-electric and Piezo-resistive tactile sensors

(b) NTC and PTC thermistors

3C. It is found that the temperature of operation for a given system ranges from - 200 to 900 degree Celsius (in an oxidizing atmosphere). Which among the various types of thermocouple will be the most appropriate for temperature sensing in such situation? Justify your answer. **4**

4A. Discuss briefly on: **5**

(a) Construction of a typical Micro accelerometer

(b) Working principle of a typical PIR based proximity sensing of objects

4B.	With relevant diagrams, explain the construction and working of a typical resonating-frequency based micro-pressure sensor.	**5**
5A.	With figures explain Category 1 Wireless Sensor Networks (C1WSNs)	**4**
5B.	List the various constraints dealt by WSNs	**2**
5C.	Describe the various components of a Smart sensor.	**4**

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