MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent institution of MAHE, Manipal)

FOURTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)
END SEMESTER EXAMINATIONS, APRIL - 2018

SUBJECT: SENSOR TECHNOLOGY [ICE 3284]

Duration: 3 Hour   Max. Marks:50

> Instructions to Candidates:
>
> ❖ Answer **ALL** the questions.
> ❖ Missing data may be suitably assumed.

1A	Discuss the need for calibration of sensors.	2
1B	Differentiate between active and passive sensors with relevant examples	3
1C	Give a detailed note on the various static characteristics that define a sensor.	5
2A	Illustrate on how ultrasonic sensors are used to measure the flow of a fluid inside a pipeline.	2
2B	Discuss upon the construction and working of LVDT. Also discuss upon the output characteristics of a typical LVDT.	3
2C	How are Eddy-Current sensors different from Hall effect sensors for measuring displacement?	5
3A	Give a short note on the working principle of ATR-IR spectrophotometry.	2
3B	Define Pyroelectric Effect. Also, explain briefly upon the working of a typical pyroelectric motion sensor.	3
3C	Explain on fluid-pressure measurement by sensors using the following transduction: (i) Capacitance (ii) Resonance	5
4A	Discuss upon the various processes adopted to target and anchor organic molecules in biosensors.	3
4B	List out the major tasks involved in the development of a biosensor after identifying a target analyte.	2
4C	(i) Explain the working principle of a cassette-type lateral-flow immunochromatic assay. (ii) Give a short note on Metal-Oxide chemical Sensors.	5
5A	What are the various features of a typical smart sensor?	2
5B	Distinguish between WSN1 and WSN2 categories of sensory network architectures	3
5C	Briefly discuss upon: (i) The resource constraints that governs the choice of WSN Sensor nodes (ii) The intrinsic design requirements for WSNs and WNs	5