



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2019

SUBJECT: SMART SENSORS [ICE 4012]

TIME: 3 HOURS

MAX. MARKS: 50

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

- 1A. With the block diagram, explain the function of sensor node.
1B. Explain the arbitration process in the CAN bus.
1C. Differentiate between beacon and non-beacon communication in Zigbee. (4+4+2)
- 2A. With the connection diagram, represent the data format of MODBUS.
2B. What is meant by Sensor integration? Show the sensor integration model of third generation .
2C. Classify the functions of 1451.2 and 1451.1 (2+3+5)
- 3A. Inscribe the transducer channel operating state diagram of 1451.3
3B. Describe the layered framework of 1451.5
3C. Explain the functions of each of the layers in 1451.1.4 protocol. (4+3+3)
- 4A. With the block diagram, discuss the functions of 1588-2008 protocol.
4B. Sketch the architecture of process control over internet.
4C. Differentiate between concept of in-the-loop and out-of-the-loop in Intelligent transport system. (4+3+3)
- 5A. Describe the functional elements of smart grid.
5B. What is smart meter integration?
5C. Explain the framework of Intelligent Transport System. (4+2+4)
