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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, M.Tech. - Mechanical Engineering (MCIM)
Semester End Examination; Dec.- 2019
Industrial Sensors and Analysis Techniques

Time: 3 hrs   Max. Marks: 100

*Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. With a neat block diagram, explain open and closed loop control system.   10

  b. Explain principle and operation of photoelectric sensors and also mention their applications in manufacturing.   10

2 a. List different detection methods used by photoelectric sensors, explain any one and also mention its applications.   10

  b. Explain laser sensors with its components along with their industrial applications.   10

UNIT - II

3 a. Explain how network of sensor are used in detecting machinery fault in flexible manufacturing systems?   10

  b. Explain how a message movement takes place with a computer network using Open System Interconnect (OSI)?   10

4 a. Discuss how the information is exchanged in manufacturing system using RS-232 based networks and Ethernet.   10

  b. Explain software problems occurred in flexible manufacturing system.   10

UNIT - III

5 a. Explain in brief, different identification systems used to identify moving parts in automated manufacturing operation.   10

  b. Explain the role of position encoder sensors manufacturing.   10

6 a. Illustrate how sensors are used in detecting faults in bearings.   10

  b. With a neat block diagram, explain the role of sensor for vibration measurement of a structure.   10

UNIT - IV

7 a. With a neat diagram, explain how semiconductor absorption sensors are used as temperature sensors in process control?   10

  b. Explain the working and operation of a fiber optic pressure sensor using a *Y*-guide probe.   10

8 a. Explain with a neat diagram, how a laser dopler velocity sensor is used to measure any desired component velocity?   10

  b. Explain with a relevant sketch, the ultrasonic non-destructive evolution sensors.   10

UNIT - V

9 a. Explain the appliction of machine vision sensors in controlling robots for industrial automation. 10

 b. Explain the role of end-effector camera sensor for edge detection and extraction of image. 10

10 a. Explain in brief the four conditions that govern the perfomance of a sound vision sensor. 10

 b. Explain the working of linear variable displacement transformer sensor in robot end effector. 10

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