



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, M. Tech. - Mechanical Engineering (MCIM)

Semester End Examination; Dec - 2016/Jan - 2017

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. | Write short note on: i) Microwave Sensing Application | ii) Photo electric sensors. | 10 |
| | b. | Explain any two detection methods involved in the sensors. | 10 |
| 2 a. | State the differences between open and closed loop control system. | | 10 |
| | b. | Explain briefly inductive and capacitive proximity sensors. | 10 |

UNIT - II

- | | | | |
|------|--|--|----|
| 3 a. | Give an account on sensor Tracking the mean time between operator Interventions. | | 10 |
| | b. | With a neat block diagram, explain how message movement takes place with a computer network. | 10 |
| 4 a. | Explain how the networks of sensors are used in detecting machinery faults. | | 10 |
| | b. | Briefly explain the functional parameters in Manufacturing system. | 10 |

UNIT - III

- | | | | |
|------|--|---|----|
| 5 a. | Explain the fuzzy logic for Opto-electronic color sensors in manufacturing. | | 10 |
| | b. | With relevant sketch explain how sensors are used in measuring vibrations in a structure. | 10 |
| 6 a. | Explain how the Opto-electronic sensors are used in tracking targets in structure. | | 10 |
| | b. | Illustrate how sensors are used in detecting faults in bearings. | 10 |

UNIT - IV

- | | | | |
|------|---|--|----|
| 7 a. | Explain briefly on the usage of sensors used in measuring temperature and pressure. | | 10 |
| | b. | Describe the control of Input/Output speed of continuous Web fabrication using Laser Doppler velocity sensors. | 10 |
| 8 a. | Explain with a relevant sketch-ultrasonic non destructive evaluation sensors. | | 10 |
| | b. | Write short notes on : i) Process control sensors ii) Fibre Optic sensor. | 10 |

UNIT - V

- | | | | |
|-------|--|--|----|
| 9 a. | Illustrate how robot is guided using vision system. | | 10 |
| | b. | Explain the working of end effector linear variable displacement transformer sensor. | 10 |
| 10 a. | Explain briefly the application of end effector sensor camera. | | 10 |
| | b. | Write short notes on: | 10 |
| | i) | Ultrasonic end effector | |
| | ii) | Multi sensor controlled robot assembly. | |