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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Industrial and Production Engineering

Semester End Examination; Dec. - 2019

Mechatronics

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
ii) Thermodynamic data hand book / steam tables may be used.

UNIT - I

1a. Explain with the block diagram the basic elements of a measurement system. 8

b. Explain with the block diagram how a microprocessor control is used to control the focusing and exposure in an automatic camera? 12

2 a. Explain with a neat sketch proximity sensor and Hall effect sensor. 12

b. Explain the following terminology related to sensors: 8

i) Accuracy ii) Repeatability

iii) Stability iv) Sensitivity

UNIT - II

3 a. What is the necessity of signal conditioning? Explain with neat sketch operational amplifier. 8

b. What are filters? Explain Low pass, High pass and Band pass filters. 6

c. What is digital signal processing? Explain pulse modulation. 6

4 a. With the help of pixel matrix and voltage waveforms, explain LED's. 10

b. Explain the principle of Magnetic recording with sketch. 10

UNIT - III

5 a. Explain briefly with the sketch, internal architecture of microprocessor architecture. 15

b. Differentiate between microprocessor and microcontroller. 5

6 a. Explain with neat sketch, the Data bus, Address and Control bus of microprocessor system. 10

b. Explain the following logic gates with symbol: 10

i) AND ii) OR

iii) NOR iv) NAND

UNIT - IV

7 a. Explain the following with characteristics curves: 8

i) Diode

ii) Thyristor

b. What does MOSFET mean? Illustrate how it can be used to control the DC motor? 8

c. With the characteristic curve, briefly explain the Triac. 4

Contd…2

8 a. What are stepper motors? Explain with a neat sketch the principle of working of a variable reluctance stepper motor. 10

b. Highlight the constructional and working of single phase and three phase induction motor. 10

UNIT - V

9 a. Explain different types of learning in neural Networks. 12

b. What is an AI? Explain perception and cognition. 8

10 a. Explain the features of PLC and analog input and output. 8

b. Difference between timers and counters. 6

c. Explain different types of shift registers with an example. 6

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