



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

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. - Mechanical Engineering
Semester End Examination; Dec - 2016/Jan - 2017

Mechatronics and Microprocessor

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

- 1 a. Define closed loop control system. Explain the various elements of closed loop control system. Substantiate with an example. 10
- b. Define microprocessor based control systems. With block diagram, explain the working principle of Engine Management system. 10
- 2 a. Explain with a neat sketch, the working principle of PVDF Tactile sensor. 8
- b. Explain briefly various types of light sensors. 12

UNIT - II

- 3 a. With a sketch and driver circuit explain how relays work? 8
- b. Explain the various forms of MOSFET's with sketches. 6
- c. Briefly explain the characteristic curves for Thyristors and Traic. 6
- 4 a. Briefly explain permanent magnet DC motors. Also explain Torque-speed characteristics. 10
- b. With sketches, explain variable reluctance stepper motor and permanent magnet stepper motor. 10

UNIT - III

- 5 a. Explain various signal conditioning processes. 6
- b. With circuit diagrams, derive an expression for total voltage gain in inverting and non-inverting operational amplifier. 14
- 6 a. Define Filters. Briefly explain the various types of filters. 8
- b. With circuit diagram, explain R-2R ladder type DAC. 12

UNIT - IV

- 7 a. With a neat block diagram, explain 8085A microprocessor architecture. 12
- b. Write a note on register of microprocessors. 8
- 8 a. Explain briefly the classification of Instruction set of 8085 microprocessor. 10
- b. Explain Machine, Assembly and High level language programming. 10

UNIT - V

- 9 a. What are Logic gates? Discuss OR, NAND and XOR gates with their symbols and truth tables for three inputs. 12
- b. How to represents a floating point numbers? Explain with an example. 8
- 10 a. Convert the following from given number system to another number system :
- i) Hexadecimal F10A to Decimal number
- ii) Decimal 687.710 to Hexadecimal 12
- iii) Decimal 2765.235 to Octal
- iv) Octal 5367 to Binary.
- b. Write a note on 2's compliment subtraction. Explain with an example. 8

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