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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) Decimal2765.235 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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