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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. - 2014
Mechatronics and Microprocessor

Time: 3 hrs   **Max. Marks: 100**

*Note: Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.*

PART - A

1. a. With a block diagram, explain the basic elements of a closed loop control system. 10

   b. With a basic element of a micro – processor – based controls explain the engine management system. 10

2. a. Explain the following terms,

   i) Light sensors

   ii) Tactile sensors 6

   iii) Proximity sensors

   b. With a suitable sketches, explain the following type of sensors,

   i) Hall effect sensors 14

   ii) Piezo electric sensors.

3. a. With a circuit diagram, explain MOSFETs, diodes and thyristors. 8

   b. With a sketch, explain the following types of stepper motors.

   i) Variable reluctance stepper motor.

   ii) Permanent magnet stepper motor. 12

   iii) Hybrid stepper motors.

4. a. Briefly explain the signal conditioning process. 6

   b. With a block diagram and sketch explain analogue to digital conversion (ADC) 8

   c. Explain with a block diagram multiplexers 6

PART-B

5. a. With a simple sketch, explain the general form of a micro-processor system. 10

   b. With a suitable examples explain the following:

   i) Mnemonic codes

   ii) Machine and assembly languages 10

   iii) High level language programming

6. a. Explain with various elements of 8085a architecture (Intel 8085 processor) 12

b. Explain the following types of buses,

   i) Data bus   ii) Address bus   8

   iii) Control bus   iv) Instruction types.

7 a. With simple sketches, explain the timing and control units for the microprocessor.   6

  b. Explain memory and Input / output cycles to write and read for a microprocessor based system.   6

  c. Explain the following terms,

     i) HALT and HOLD STATES

     ii) Initiating system operations   8

     iii) Transition sequence.

8. a. Explain with one example each for the following,

     i) Positional number system

     ii) Binary number system   10

     iii) Decimal number system.

  b. With an example explain the following terms,

     i) Addition and subtraction of binary integers

     ii) Overflow and underflow of integers   10

     iii) Accuracy and range in floating point representation.

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