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10ME65

**Sixth Semester B.E. Degree Examination, June/July 2017**  
**Mechatronics & Microprocessor**

Time: 3 hrs.

Max. Marks:100

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

**PART - A**

- 1 Discuss any four of the following with neat sketch and an example:  
 (i) Mechatronics (ii) Open loop control system.  
 (iii) Closed loop control system (iv) Measurement system.  
 (v) Transducers. (20 Marks)
- 2 a. Define the following transducers with examples:  
 (i) Analog transducer. (ii) Digital transducer.  
 (iii) Active transducer. (iv) Passive transducer.  
 (v) Mechanical transducer. (10 Marks)
- b. Explain with a neat diagram, (i) Capacitive proximity sensor. (10 Marks)  
 (ii) Principle of Hall effect. (10 Marks)
- 3 a. What are solid state switches? Discuss any four solid state switches. (10 Marks)  
 b. Explain the working principle of,  
 (i) Permanent magnet DC motor. (ii) Permanent magnet stepper motor. (10 Marks)
- 4 a. Illustrate how OPAMPS can be realized for,  
 (i) Integrating amplifier circuit. (ii) Differential amplifier circuit. (10 Marks)  
 b. Define signal processing. Explain with neat diagram Analog Signal processing and Digital signal processing. (10 Marks)

**PART - B**

- 5 a. State De Morgan's theorem. Draw logic circuits and truth tables. (06 Marks)  
 b. Convert the following:  
 (i) Decimal number 35 to binary equivalent.  
 (ii) Binary 1100101 to decimal No.  
 (iii) Binary real number 1101.11 to decimal real number (06 Marks)
- c. With help of symbols and truth table, explain,  
 (i) AND gate (ii) OR gate. (iii) NOT gate. (iv) NAND gate. (08 Marks)
- 6 a. Explain with a neat sketch of architecture 8085A microprocessor. (12 Marks)  
 b. With circuit diagram explain, (i) RAM (ii) ROM (08 Marks)
- 7 a. Write the functional block diagram of INTEL 8085 microprocessor and explain 3 important sections of microprocessors. (08 Marks)  
 b. Briefly explain with sketch:  
 (i) Instruction register (IR) (ii) Data register (iii) I/O buffers (12 Marks)
- 8 a. Explain with a neat diagram of,  
 (i) Instruction word. (ii) Data word. (10 Marks)  
 b. Explain with block diagram, the register organization of an INTEL 4004  $\mu$ P. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.