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**Sixth Semester B.E. Degree Examination, June/July 2011**  
**Mechatronics and Microprocessor**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. What are the objectives of Mechatronics? (05 Marks)
- b. What are the advantages, disadvantages and applications of Mechatronics? (05 Marks)
- c. Explain control system, their elements and functions with examples. (10 Marks)
- 2 a. Explain the following:
  - i) Primary and Secondary transducer. (06 Marks)
  - ii) Active and Passive transducer. (07 Marks)
  - iii) Analog and Digital transducer. (07 Marks)
- b. Explain "Hall Effect" and explain how this effect can be used to construct a sensor? (07 Marks)
- c. Explain the working principle of the following (with sketch):
  - i) Eddy current proximity sensors. (07 Marks)
  - ii) Capacitive proximity sensors. (07 Marks)
- 3 a. What is the bouncing in mechanical switches? Explain the hardware solution to the bouncing problems. (08 Marks)
- b. Differentiate between a diode, thyristors and transistor. (05 Marks)
- c. Sketch and explain the working of a stepper motor. (07 Marks)
- 4 a. Write the basic relationship of an operational amplifier. (08 Marks)
- b. Explain the wheat stone bridge circuit used for strain measurement. (07 Marks)
- c. Write a note on data acquisition. (05 Marks)

**PART – B**

- 5 a. With the help of a neat sketch explain the organization of a micro processor and state the functions of each element of the microprocessor. (06 Marks)
- b. In brief, explain the evolution of microprocessors. (04 Marks)
- c. State Demorgan's theorems. Draw logic circuits. (04 Marks)
- d. Explain different methods of representing negative number. (06 Marks)
- 6 a. What are micro controllers? Distinguish between a micro processor and a micro controller. (06 Marks)
- b. Define the following:
  - i) Write cycle ii) State bus iii) Interrupts iv) Assembler (08 Marks)
- c. Give the classification of micro controllers. (06 Marks)
- 7 a. With the help of a neat sketch, explain the following:
  - i) Address bus. (07 Marks)
  - ii) Data bus.
  - iii) Control signals (bus)

- b. Explain the following:
- i) Machine language.
  - ii) Assembly Language.
  - iii) Compiler and Interpreter. (06 Marks)
- c. With reference to 8085, classify the instruction set and explain the following:
- i) Program counter.
  - ii) Flags.
  - iii) Registers.
  - iv) Stack pointer.
  - v) Accumulator. (07 Marks)
- 8 a. With the help of a neat sketch explain the data and instruction flow in a 8085 microprocessor. (06 Marks)
- b. What are different types of registers in a micro processor (Give classification). Explain each one of them in brief. (06 Marks)
- c. Explain the following with sketches:
- i) Fetch operation (cycle).
  - ii) Execute operation (cycle).
  - iii) Instruction cycle.
  - iv) System clock. (08 Marks)

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