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10MA63

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Mechatronics

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Define mechatronics. Explain the differences between conventional approach and mechatronic approach to product design. (10 Marks)
b. Explain with a block diagram the working of microprocessor controlled washing machine. (10 Marks)
- 2 a. What is Hall Effect? Explain a Hall Effect sensor. How it can be used to determine the level of fuel in an automobile fuel tank? (10 Marks)
b. How does a light sensor work? Sketch and explain the following light sensors :
i) Photo conductive sensor ii) Photo voltaic sensor iii) Photo emissive sensor. (10 Marks)
- 3 a. Explain the following terminologies related to microprocessor :
i) ALU ii) RAM iii) Interrupts iv) Assembler v) BUS (10 Marks)
b. With the help of symbols and truth tables, explain the following logic gates :
i) OR ii) AND iii) NAND iv) NOT v) NOR. (10 Marks)
- 4 a. What are micro controllers? Explain the classification of microcontrollers. (10 Marks)
b. Differentiate between microprocessors and microcontrollers. (06 Marks)
c. Justify how microcontrollers can be used in "Tailor made application" today. (04 Marks)

PART – B

- 5 a. Explain (any two of the following).
i) Friction Guide ways ii) Antifriction Guide ways
iii) Frictionless Guide ways, and mention their advantages and disadvantages. (10 Marks)
b. Compare and contrast antifriction and frictionless bearing. (05 Marks)
c. What is preloading of bearings, explain any one method. (05 Marks)
- 6 a. What are solid state switches? Explain any two types of solid state switches. (10 Marks)
b. What are stepper motors? Explain permanent magnet stepper motor and variable Reluctance stepper motor with neat sketches. (10 Marks)
- 7 a. With the help of neat sketch explain the pressure Reducing valve and pressure sequencing valve. (10 Marks)
b. With the help of a neat sketch explain vane motor. (06 Marks)
c. Draw the symbols for the following :
i) Direction control valve ii) Solenoid operated valve
iii) Pressure sequencing vale iv) Shuttle valve. (04 Marks)
- 8 a. Define signal conditioning. (02 Marks)
b. Explain inverting OP-AMP and non-inverting OP-AMP with a neat sketch. (10 Marks)
c. What is data acquisition? Explain with a neat diagram the data acquisition board. (08 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.