Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 31049

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

3.6.13 - AN

Mechanical Engineering

080120045 — MECHATRONICS

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the various modes of control system.
2. What are the basic elements of feedback system?
3. Write short notes on the significance of gauge factor.
4. List the factors to be considered while selecting a motor.
5. Draw the PLC ladder diagram for an AND gate.
6. Draw the schematic of a comparator.
7. Write short notes on point to point control.
8. What are the peripheral units of a microcontroller?
9. List down the advantages of MEMS.
10. List the differences between traditional and mechatronic design.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the application of various types of actuators. (8)

(ii) Write short notes on PID control mode. (8)

Or

(b) (i) Compare the performance of various electrical actuators. (8)

(ii) Explain the features and applications of servomechanism. (8)

12. (a) Discuss how displacement is sensed by LVDT. With neat sketch show how it can be made phase sensitive.

Or

(b) What are the characteristics of brushed DC motors? What is the function of commutator-brush arrangement? Explain the principle of operation.

13. (a) Develop a PLC circuit for the following lighting control system. The system will be controlled by four switches S1, S2, S3 and S4. These switches will control the lighting in a room .based on the following criteria :

(i) Any one of three switches S1, S2 and S3, if turned ON can turn the lighting on, but all three switches must be OFF before the lighting will turn off

(ii) The fourth switch S4 is a master control switch. If this switch is in ON position, the lights will be OFF and none of the other three switches have any control.

Or

(b) (i) Distinguish between inverting and non inverting amplifiers. (8)

(ii) Draw the circuit diagram of Integrator and Differentiator by the use of OPAMP. Also discuss the principle of operation. (8)

14. (a) Explain the control of a contouring system in a CNC with a neat block diagram.

Or

(b) Explain the architecture of 8051 controller.

15. (a) (i) Compare wet and dry etching process. (8)

(ii) Discuss the surface manufacturing process of a cantilever beam. (8)

Or

(b) Explain about the design of a mechatronics system considering the assembly of different parts of a ceiling fan using robot.
