Reg. No. :

Question Paper Code : **11050**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Seventh Semester

Mechanical Engineering

080120045 — MECHATRONICS

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How is mechatronics defined?

2. Why is PID controller considered as best controller?

3. What is hysteresis error in transducers?

4. How are solenoids used?

5. What are the advantages of Programmable Logic Controllers (PLC)?

6. Draw the ladder diagram of a NAND system.

7. How is accuracy maintained in CNC machines?

8. What is a microcontroller?

9. What does a MEMS system generally consist of?

10. List any four differences between traditional and mechatronics design.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss different types of cam followers and their applications.

Or

(b) Three cylinders are controlled by cascade control. Discuss their function using a hydraulic circuit.

12. (a) (i) Discuss the functioning of strain-gauged elements. (8)

(ii) How are linear variable differential transformers used to control the length of machine slide movements? (8)

Or

(b) (i) Discuss the use of tachogenerators with a diagram. (8)

(ii) What is the construction of brush less DC servomotors? State their advantages compared to DC servomotors. (8)

13. (a) Discuss any five types of signal conditioning process with examples.

Or

(b) (i) Draw the ladder diagram of motor latching and explain. (8)

(ii) How are internal relays used for starting multiple outputs? Discuss with a ladder diagram. (8)

14. (a) Draw the block diagram of the structure of a CNC controller. Explain the functions.

Or

(b) How is adaptive control used in metal cutting machines? What are the parameters checked? What type of sensors used?

15. (a) What are the basic processes of MEMS? Discuss them in detail. Discuss the processes like deposition, lithography and others.

Or

(b) Discuss in detail the applications of MEMS. Include details of sensors, actuators and structures.

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