Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 41049

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Mechanical Engineering

080120045 — MECHATRONICS

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the components of a mechatronics system?

2. What is the role of control system in mechatronics system?

3. Define repeatability and reproducibility in sensors.

4. What is Hall Effect?

5. What is ladder programming in PLC?

6. How PLC is different from mini computer?

7. What is cutting speed? How it is significant to the production?

8. Name few types of sensors used in CNC machine for position and velocity.

9. Draw the flowchart for mechatronics system design.

10. Differentiate bulk and surface manufacturing.

PART B — (5 × 16 = 80 marks)

11. (a) Explain open and closed loop with suitable examples. (16)

Or

(b) Explain in detail of cylinder sequencing in pneumatic systems. (16)

12. (a) (i) Explain the working principle of DC servomotors. (8)

(ii) Explain cycloconvertor. (8)

Or

(b) (i) Explain the working principle of Piezoelectric actuators. (8)

(ii) Explain the velocity sensor with suitable diagram. (8)

13. (a) Explain architecture of PLC. (16)

Or

(b) (i) Explain any one type of operational amplifiers. (8)

(ii) Explain master relay control in PLC with diagram. (8)

14. (a) (i) Explain adaptive control system with a diagram. (8)

(ii) Explain with a diagram of point to point system. (8)

Or

(b) (i) Explain the microcontroller with a block diagram. (8)

(ii) Explain the factors for selecting the microcontrollers. (8)

15. (a) (i) Explain micro grippers with a diagram. (8)

(ii) Explain the design process for mechatronics systems. (8)

Or

(b) Explain about the design of a mechatronics system considering wind screen wiper motion as an example. (16)

———————————