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

Question Paper Code : 31576

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

Seventh Semester

Mechanical Engineering

ME 2401/ME 71/ME 1402/10122 ME 702 — MECHATRONICS

(Common to Production Engineering)

(Regulation 2008/2010)

(Common to PTME 2401 – Mechatronics for B.E. (Part-Time) Fifth Semester Mechanical Engineering – Regulation 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List down the type of proximity sensor.

2. Distinguish between position sensor and light sensor.

3. Compare hydraulic system with pneumatic system.

4. State the function of a control valve.

5. Define the term electromechanical system.

6. What are the advantages and disadvantages of PID control?

7. Define a programmable logic controller.

8. What are shift registers?

9. Distinguish between traditional design approach and mechatronics approach.

10. Write the basic steps of the program to run a stepper motor.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the working principle of automatic camera. (8)

(ii) Describe neatly potentiometer sensor. (8)

Or

(b) (i) Explain the working of pneumatic load cell. (8)

(ii) Explain the temperature measurement using thermocouples. (8)

12. (a) (i) What is the principle and construction of vane pump and vane motor? (8)

(ii) Describe the basic details of a 4/2 valve and a 5/2 valve. (8)

Or

(b) Explain the construction and working principle of AC and DC motor. (16)

13. (a) (i) Explain the mechanical systems models. (8)

(ii) Explain the hydraulic power system. (8)

Or

(b) (i) Briefly explain the ON-OFF controllers and give their limitations. (8)

(ii) Describe any application of proportional controllers and their limitations. (8)

14. (a) Explain the basic structure of a PLC. (16)

Or

(b) Explain the following :

(i) Timers (5)

(ii) Counters (5)

(iii) Internal relays. (6)

15. (a) Discuss the design aspects of pick and place robot in terms of various mechatronics element involved. (16)

Or

(b) Explain the design of a mechatronic system used in a engine management system. (16)

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