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Question Paper Code : 33591

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

Seventh Semester

Mechanical Engineering

ME 1402/PR 1351 A — MECHATRONICS

(Common to Sixth Semester Production Engineering)

(Regulation 2004/2007)

(Also common to B.E. (Part-Time)–Sixth Semester – Mechanical Engineering –
Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by thermopile? Where is it being used?
2. Define time constant of a transducer and what is its significance.
3. Brief on bipolar transistors.
4. What is the significance of pressure sequence valve?
5. With an example, brief on adaptive control.
6. Write and discuss about RLC system model.
7. Brief on sinking.
8. Draw a ladder diagram for XOR operation.
9. Brief on integrated design methodology.
10. List down the sensors used in engine management system.

PART B — (5 × 16 = 80 marks)

11. (a) Write short notes on the following: RVDT, strain gage load cell, pneumatic load cell and thermistor.

Or

- (b) Explain about the following: venturimeter, incremental encoder, tactile sensors, and pyro electric sensor.

12. (a) Explain about the different types of electrical actuator systems.

Or

- (b) Discuss about hydraulic power supply system in detail.

13. (a) Explain the microprocessor controller with an example of CNC tool turret control.

Or

- (b) Discuss about three modes of PID controller with example and its characteristics.

14. (a) Discuss in detail about PLC for a washing machine.

Or

- (b) Explain in detail about different types of registers.

15. (a) Design a mechatronics controller for a pick and place robot.

Or

- (b) Discuss in detail about the design for a ticket vending machine.