G 1062

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Eighth Semester

Branch : Electronics and Communication Engineering

EC 010 805 G03 – MECHATRONICS (Elective IV) [EC]

(New Scheme–2010 Admissions)

[Regular]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 3 *marks.*

1. Briefly explain the steps in mechatronic system design process.
2. With neat sketch, explain the working of liquid level sensor.
3. What is ladder programming? Explain with an example program.
4. What are the various tasks performed by I/O interfaces?
5. What are the control modes used in closed loop control system?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. What are the advantages of mechatronic system over conventional system?
7. With neat sketch, explain the working of absolute and incremental encoders.
8. With neat sketch, explain the working of Variable reluctant stepper motor and Permanent magnet stepper motor.
9. Draw the general ladder rungs to represent a latch circuit.
10. Differentiate between proportional plus derived control and proportional plus integral control.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*

Each question carries 12 *marks.*

11. (a) Explain the basic elements of closed loop control system with the help of an automatic water level controller.

    (b) Briefly explain Analog and Digital control system.

(8 + 4 = 12 marks)

Or

12. Explain Hydraulic and Pneumatic system building blocks.

13. List and explain any *eight* performance terminologies of transducers.

Or

14. With neat sketch, explain the working of following sensors :

    (a) Potentiometer sensor.

    (b) Pneumatic sensor.

    (c) Hall effect sensor.

(4 + 4 + 4 = 12 marks)

15. Briefly explain the working of the solenoid operated spool valve with a neat sketch. Give the symbol of 3/2 and 4/2 valve symbols.

Or

16. With the help of a block diagram, explain the main components of a programmable logic controller and write program to energies when two switches are closed.

17. What are the elements of data acquisition and control system?

Or

18. Discuss the method of finding transient response of a control system from their root locus.

19. Design a vehicle management system for a four stroke four cylinder engine on the basis of mechatronics approach.

Or

20. Design a mechatronics system for a pick and place robot and explain the various mechatronics elements.

[5 × 12 = 60 marks]