G 404 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Sixth Semester

Branch : Applied Electronics and Instrumentation Engineering

AI 010 606 L01—MECHATRONICS (Elective I) [AI]

(New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. What is Mechatronics ?
2. What do you meant by filtering on the context of signal conditioning ?
3. Draw the symbol for directional valve.
4. What are the challenges facing MEMS industry today ?
5. What are the basic elements used for describing a thermal system ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. List the advantages and disadvantages of integrating electronics to mechanical devices.
7. Explain the need for signal conditioning in a Mechatronic system. Write short note about various signal conditioning operations performed.
8. Write short notes on stepper motors.
9. Explain in detail the applications of MEMS.
10. Derive the governing equation of a thermal system.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. Compare and contrast the traditional design of a watch with that of the mechatronics designed product involving a microprocessor.

Or

Turn over

12. Compare the traditional approach and mechatronic approach to process control and instrumentation.

13. With a neat labelled diagram, explain the various building blocks of a data acquisition system.

Or

14. Explain in detail the role of microprocessors and microcontrollers in Mechatronic system design.

15. Explain with neat diagram of rotary actuators constructional detail and working principles.

Or

16. What is the basic principle used in the construction of piezoelectric actuators. Explain its application.

17. Explain the following MEMs applications :

    (a) Accelerometers.

    (b) Pressure sensors.

(2 × 6 = 12 marks)

Or

18. Explain the following MEMs application :

    (a) Micro pumps.

    (b) Inkjet printers.

(2 × 6 = 12 marks)

19. Explain briefly how the Mathematical model of a mechanical system is build up.

Or

20. Write short notes on fluid power systems.

[5 × 12 = 60 marks]