



Reg. No. :

Name :

Seventh Semester B.Tech. Degree Examination, November 2013

(2008 Scheme)

08.702 : MECHATRONICS (MPU)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **All** questions carry **equal** marks.

1. Define a first order system with examples.
2. Differentiate between transient and steady state responses of a system.
3. Explain the term sensitivity of a measuring instrument.
4. Differentiate between RTD and thermocouple.
5. What is a Corioli's flow meter ?
6. What is the need for adaptive control ?
7. What do you mean by cushioning of fluid power actuators ?
8. Why CVD is preferred over PVD in MEMs fabrication ?
9. Explain PWM.
10. What is a forced oscillation slip sensor ?

(10×4=40 Marks)

PART – B

Answer **one** question from **each** Module.

MODULE – I

11. a) Explain the working of a MEMs gyroscope.
b) Discuss the use of different types of valves and their actuation mechanisms.

OR





12. a) Explain how rotary position can be sensed using synchros.
b) Explain how a MEMs parallel plate accelerometer works.

MODULE – II

13. a) Explain the different types of NC controls.
b) Construct a ladder logic for a washing machine to fill water in it up to a definite level and then to start the motor for 20 min and to drain the water using another valve.

OR

14. a) Construct a PLC ladder diagram to automate a drilling machine in the following sequence
- | | |
|---------------------|-----------------------|
| 1-Clamp work | 2-drill motor on |
| 3-drill | 4-dwell for 3 seconds |
| 5-retract drill bit | 6-motor stop |
| 7-declamp work | |
- b) Explain the mathematical model for a thermal system under conductive heat transfer

MODULE – III

15. a) Explain the working of a permanent magnet stepper motor.
b) Explain the PWM method for speed control of a DC motor.

OR

16. a) Explain the working of an ultrasonic range finder.
b) Explain the construction and working of any two types of tactile sensors used in robotics. **(3×20=60 Marks)**
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