



Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, June 2018
(2008 Scheme)
08.702 : MECHATRONICS (MPU)**

Time : 3 Hours

Max. Marks : 100

PART – A

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

1. Name the main elements constitute in mechatronics system.
2. Why three concentric tracks are used in an optical incremental encoder ?
3. Write two factors that need to be considered in selecting a sensor for a particular application.
4. Write down any four primary functions of mechanical actuation systems.
5. List down the advantages of MEMS.
6. Define the elements used to build fluid systems.
7. What are the features of Programmable Logic Controllers ?
8. Calculate the step angle of a stepper motor if it takes 120 steps in one revolution.
9. How do you classify the Sensors ?
10. Automatic camera is a mechatronic system. Comment on it.

(10×4=40 Marks)

PART – B

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

Module – I

11. Explain in detail construction and working of LVDT also draw the characteristics of output voltage for different core position for LVDT. **20**
12. a) Explain with sketches the working of Four Mechanical actuation systems. **14**
b) Explain the application of various types of actuators. **6**

**Module – II**

13. a) Derive the equation for the load bearing capacity, frictional power loss, energy losses of a hydrostatic step bearing. 15
- b) What is the role of restrictors in such bearings ? 5
14. a) Derive the differential equation governing the mechanical system of an electric motor. 8
- b) Derive the equation for a translational mechanical system model with spring and mass. 8
- c) What are the advantages and disadvantages of open loop system ? 4

Module – III

15. Explain the constructional features of the DC motor with a neat sketch and discuss about their steady state characteristics with suitable graphs. 20
16. Explain the construction, working and applications of following :
- i) Proximity sensor 10
- ii) Force and Pressure sensors. 10

(3x20 =60 Marks)
