SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2016
(2013 SCHEME)
13.702 MECHATRONICS (MPSU)

Time: 3 Hours   Max.Marks:100

N.B: Answer all questions from PART- A and any one question from each module in PART-B.

PART – A

1. **Difference between Absolute encoder and Incremental encoder**

2. **Write down any four functions of Mechanical Actuation Systems**

3. **Explain the working of Capacitive Sensors**

4. **How does PLC differ from Microprocessor**

5. **Describe the working of Tactile Sensor**

6. **What do you mean by Robotic Vision System**

7. **What are the factors to be considered to selecting PLC**

8. **Automatic camera is a Mechatronic system ,Justify**

9. **Differentiate between Accelerometer and Gyroscope**

10. **What do you meant by CNC**   (2*10 = 20)

PART-B

MODULE- 1

11. **a) Write a short note on**

      i)   Incremental Encoder

      ii)   Gray coded Encoder   **(12)**

   b) Discuss the Static and Dynamic characteristics of a Sensor   **(8)**

OR

12. **a) Explain the principle and types of Vibration Sensor** (10)

    b) Compare Piezoelectric Sensors and Acoustic emission sensors (10)

MODULE-2

13. a) Using a simple circuit explain the basic components required for a hydraulic actuation system (10)

b) Explain the principle and working of MEMS based Pressure Sensor and Gyroscope (10)

OR

14. a) Explain in details Pneumatic circuit for Mechatronic system (10)

b) Explain

    i) DRIE

    ii) LIGA (10)

MODULE-3

15. a) Discuss the closed loop control system suitable for shaft speed control with a neat block diagram (8)

b) Explain any two types of bearing with suitable sketches (12)

OR

16. a) How will you select a PLC for a specific application (6)

b) Sketch a ladder diagram and explain four pressure alarm. Alarm should be sounded if a sensor indicates the pressure above 2 bar and remain sounding until the pressure falls below 1 bar (6)

c) Discuss how AND, OR, NOR and NAND systems can be formed with ladder diagrams (8))

MODULE-4

17. a) What is a Stepper motor , Explain the working principles of Stepper motor
    in half step mode   (12)

    b) Explain the Mechatronics in Robotics   (8)

OR

18. a) Explain the Mechatronic systems used in an automatic camera with neat
    block diagram   (12)

    b) Write a short note on automatic car park barrier system   (8)