



(Pages : 2)

A – 3795

Reg. No. : .....

Name : .....

**Seventh Semester B.Tech. Degree Examination, June 2016**

**(2008 Scheme)**

**08.702 : MECHATRONICS (MPU)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions. **4** marks **each**.



1. Define hysteresis in sensors. Give one example.
2. What is meant by resolution of incremental encoder ? How the resolution can be improved for it ?
3. Write two applications for piezoelectric effect in sensors.
4. Sketch a schematic diagram and hydraulic symbol for pressure sequence valve. Write the functioning.
5. What are positive and negative photo resists in MEMS fabrication ?
6. What is meant by 'stick-slip' in friction guideways ? How this effect can be reduced ?
7. Distinguish between hydrostatic and hydrodynamic bearings.
8. Describe the architecture of PLC.
9. What is tactile sensing ? Give examples.
10. What is meant by 'thresholding' of histogram ?

**(4×10=40 Marks)**

P.T.O.



## PART - B

Answer **one** complete question from each Module :

**Module - 1**

11. a) Illustrate the functioning and application for synchros and resolves. 20  
b) Explain vibration sensors. 20
12. a) Discuss the methods of temperature sensing. 20  
b) Describe the principle, construction and working of MEMS gyroscope. 20

**Module - 2**

13. a) What are the types of loads to be considered in designing the structure of CNC machine tools ? Explain its influence. 20  
b) Explain the construction and functioning of recirculating ball screws used in CNC machines. 20
14. a) Explain the types of adaptive controls used in mechatronic systems. 20  
b) Develop a mathematical model for any thermal system under conductive heat transfer. 20

**Module - 3**

15. a) Explain the working of permanent magnet stepper motor. 20  
b) Discuss any two types of range finding techniques used in robotics. 20
16. a) Develop a schematic diagram, to sense the level of liquid in a shallow container using a magnetism based proximity sensor. 20  
b) List the names and functioning of typical sensors used in automobile engine management system. 20

(20×3=60 Marks)