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Reg. No. : .....

Name : .....

**Seventh Semester B.Tech. Degree Examination, September 2020**

**(2013 Scheme)**

**13.702 MECHATRONICS (MPSU)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** carries **2** marks.

1. What is Hysteresis?
2. Explain the effects of static and dynamic characteristics on sensor elements
3. Give the mathematical representation for a capacitive element used in Mechatronic sensor
4. Explain LIGA process
5. Explain the working of Cam system
6. Give the applications of bearings in fabrication process
7. Briefly explain the design aspects of Re-circulating roller screws
8. Define PLC
9. Explain the working of CIDs
10. Give the applications of Force and Tactile sensors

**(10 × 2 = 20 Marks)**

P.T.O.



**PART – B**

Answer four full question from part B.

**Module – I**

11. (a) How are sensors useful for mechanical measurement? Explain the working of a pneumatic sensors.
- (b) Explain the working of a differential transformer with appropriate diagram.

OR

12. (a) Enumerate the working principles of the following
- (i) Incremental encoder
  - (ii) Tachogenerator
- (b) Describe the application of a strain gauge load cell.

**Module – II**

13. (a) Write an hydraulic circuit for Two-actuator sequential system.
- (b) Explain the working of Fluid control system.

OR

14. (a) Explain the working of a potentiometer sensors.
- (b) Write a note on Eddy current proximity sensors.



### Module – III

15. (a) With a neat sketch and explain Antifriction Linear motion guideways.  
(b) Describe the elements of a recirculating roller screw.

OR

16. (a) Explain the working of a mounting encoder.  
(b) Give the specific applications of flexible couplings.

### Module – IV

17. (a) Write a note on different compensations which are applicable to attain Machine accuracies.  
(b) Write the detailed steps followed to write a PLC program.

OR

18. (a) With appropriate circuit diagram explain Cabling details of CNC system used in two-axes system.  
(b) Explain the mechatronic representation of a pick and place robot system with appropriate sketch.

**(4 × 20 = 80 Marks)**

