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M – 6540

Reg. No. ....

Name : .....

**Seventh Semester B.Tech. Degree Examination, December 2021**

**(2013 Scheme)**

**13.702 : MECHATRONICS (MPSU)**

Time : 3 Hours

Max. Marks : 100

Instructions: 1. Answer all questions from Part-A and four full questions from Part-B.

2. Choosing not more than one question from each Module from Part-B

**PART – A**

**Each question carries 2 marks.**

1. With a neat sketch explain the mechatronics system.
2. Write a selection and application of PLCs.
3. Explain the procedure to select the actuators.
4. What are the four primary functions of mechanical actuation system?
5. What are the factors considering for selecting the PLC?
6. What is latching contact?
7. List the industrial application of MEMs.
8. What is micro controller?
9. How is accuracy maintained in CNC machining?
10. Explain delay on and delay off timer with ladder diagram.

**(10 × 2 = 20 Marks)**

P.T.O.



PART – B

Each question carries **20** marks.

**Module – I**

11. (a) Explain the relationship between temperature and resistance for the RTD with temperature resistance curve. What are the advantages and disadvantages of RTDs? **10**
- (b) Explain the control system for the domestic central heating system involving a bimetallic thermostats and that involving microprocessor. **10**

OR

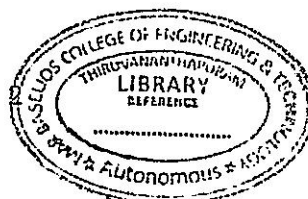
12. (a) Explain the working principle of incremental encoder. **10**
- (b) Discuss how LVDT senses displacement. With a neat sketch show how it can be made phase sensitive. **10**

**Module – II**

13. (a) Explain the piezoelectric drives with the neat sketch. State its application. **10**
- (b) Draw the delay ON and delay OFF timer ladder diagram. **05**
- (c) Explain the ladder diagram for the latching. **05**

OR

14. (a) Three cylinders are controlled by cascade control. Discuss their function using hydraulic circuit. **10**
- (b) Discuss in detail the applications of MEMs. Include details of sensors, actuators and structure. **10**



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**Module – III**

15. (a) What are the different element of CNC machine? Explain in details. 10  
(b) Explain the detail about jump control used in PLC using ladder diagram. 10

OR

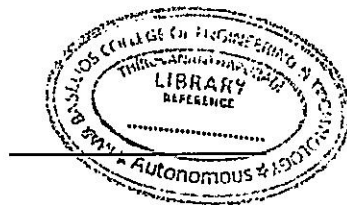
16. (a) Explain the various types of ball and roller bearing. 10  
(b) Explain the thyristors and triacs in detail. 10

**Module – IV**

17. (a) Write a short note on servo amplifier for DC motor. 10  
(b) Write note on Bar code scanner and pick and place robot. 10

OR

18. Explain the robotic vision system with image acquisition, vidicon, CCD and CID. 10



(4 × 20 = 80 Marks)

