**Reg. No. :** | | | | | | | | | | |

# Question Paper Code: 37703

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Mechanical Engineering

01UME703 - MECHATRONICS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List the advantages of Mechatronics system.
2. Define sensor and transducer.
3. State the function of a control valve.
4. Elucidate the significance of Process control valves.
5. Define the term electromechanical systems.
6. How can adaptive controllers be defined?
7. What are the main component parts of a PLC?
8. How does jump control work?
9. Distinguish between traditional design approach and Mechatronics approach.
10. Name the two barriers used in automatic car parking system and state its uses.

PART - B (5 x 16 = 80 Marks)

11. (a) Explain the microprocessor based controller with suitable example. (16)

Or

(b) (i) List some of the methods of temperature control systems and explain anyone with a sketch. (8)

(ii) Analyze the factors to be considered in the selection of sensors for a specific application. (8)

12. (a) Discuss the working principle of (i) Stepper motor (ii) Servomotors. (16)

Or

(b) Explain the following mechanical actuation system used in Mechatronics system (i) Cam (ii) Ratchet and pawl. (16)

13. (a) Discuss briefly model building block for automatic suspension system and electric motor. (16)

Or

(b) With a block diagram explain the velocity control with feedback system for the movement of a load using suitable controller. (16)

14. (a) (i) Explain the configuration of a PLC. (8)

(ii) What are the advantages of PLC over relay logic? (5)

(iii) Explain the basis of ladder programming used in PLC'S. (3)

Or

(b) (i) Explain in detail about jump control used in PLC using a ladder diagram. (10)

(ii) Draw the delay ON and OFF timer ladder diagrams. (6)

15. (a) Discuss in detail, various design factors to be considered while designing a mobile robot? (16)

Or

(b) Design a mechatronics system for an Engine Management Systems with a neat sketch? (16)