

6E 7013

Roll No. _____

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B.Tech. VI-Semester (Main & Back) Examination, April-2019
Mechanical Engineering
6ME3A Mechatronics
(Common with ME, PI)

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 26****Instructions to Candidates:**

Attempt any Five questions, selecting One question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) What is Flexible Manufacturing System (F.M.S.)? What are the advantages of F.M.S.? (8)
- b) Describe the nanotechnology in detail. (8)

(OR)

1. a) Explain in detail process control automation. (8)
- b) Describe the basic structure of micro-controllers. (8)

Unit - II

2. a) Explain the working of force sensor with suitable example. (6)
- b) Define actuation system and differentiate hydraulic with pneumatic actuation system. (10)

(OR)

2. a) Describe the piezoelectric actuators in detail. (8)
- b) Classify the sensors and also write the significance of sensors. (8)

Unit - III

3. a) What is Adaptive control design? (8)
b) Explain the neural networks with appropriate examples and write its applications. (8)

(OR)

3. a) Discuss the role of controls in mechatronics design with appropriate examples. (6)
b) Explain control system design. Differentiate adaptive and non linear control design. (10)

Unit - IV

4. a) Explain the working of analog to digital signal convertor system with suitable example. (8)
b) What is a data logger? Differentiate data logging with data recording. (8)

(OR)

4. a) What are the advantages of digital communication over analog communication. (6)
b) Describe the operational amplifiers circuit for comparator and non-inverting amplifier. (6)
c) Define frequency response system, write its advantages. (4)

Unit - V

5. a) Explain the significance and applications of mechatronic systems used specially in elevators and manipulator arms. (8)
b) Explain Computer Numerical Control (CNC) machines. (8)

(OR)

5. a) What is (ABS) Anti-Lock Braking System? Explain its operation in detail. (10)
b) Explain the temperature control systems. (6)