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| 6E7013 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E7013 | |
| | B.Tech. VI Semester (Main/Back) Examination, April/May-2017 | |
| | Mechanical Engineering | |
| | 6ME3A Mechatronics | |
| | 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 suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

1. a) What is 'Mechatronics'? Explain the components of a mechatronic system. (8)
- b) Describe in detail MEMS. (8)

OR

1. a) What is control system? Give the comparison between 'Open-loop' and 'Closed-loop' control systems. (8)
- b) Explain in detail the scope and importance of mechatronic system. (8)

Unit-II

2. a) Give classification of sensors and transducers. List main characteristics of generally used transducers. (8)
- b) Write a short note on Hydraulic and pneumatic actuators. (8)

OR

2. a) List various types of temperature sensors. Give the comparison between RTD and thermocouple. (8)
- b) Write a short note on electrical and mechanical actuators. (8)

Unit-III

3. a) Discuss in detail the role of controls in mechatronic system. What do you mean by digital control system. (8)
- b) Explain in detail the digital signal processing. What are the operations used in digital signal processing? (8)

OR

3. a) Explain an artificial neural network with suitable examples. List the major advantages of neural network. (8)
- b) What is adaptive control system? Also explain the fuzzy systems. (8)

Unit-IV

4. a) What is the necessity of 'Signal conditioning'? Explain briefly the processes usually adopted in signal conditioning. (8)
- b) Write down the performance specifications and common applications of digital to analog converters. (8)

OR

4. a) What is 'Data acquisition system'? Explain single channel data acquisition system with a neat block diagram. (8)
- b) What is data logger? Explain the computer based instrumentation system. (8)

Unit-V

5. a) Explain the design of an elevator system with neat block diagram. (8)
- b) Discuss the design and working of an aeroplane. (8)

OR

5. a) Discuss the design of a tank fluid level control system with neat sketch. (8)
- b) Write a short note on CNC lathe, describing its working and control methods. (8)

