CBCS SCHEME

USN | | | | | | | | | |

16/17MDE153

First Semester M.Tech. Degree Examination, June/July 2019
Mechatronics System Design

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Define Mechatronics and with a block diagram explain the mechatronics design approach. **(08 Marks)**

b. Explain with a block diagram the working of a microprocessor based washing machine. **(08 Marks)**

OR

2 a. Explain the principle of working of a Hall effect sensor. **(08 Marks)**

b. Explain the working of an automatic camera with a block diagram. **(08 Marks)**

Module-2

3 a. Explain with a neat sketch the principle of working of a veriable reluctance stepper motor. **(08 Marks)**

b. Explain electrical system building blocks. **(08 Marks)**

OR

4 a. Discuss about mathematical modeling of electrical systems. **(08 Marks)**

b. Elucidate the following in the context of thermal system
   i) Thermal capacitance
   ii) Thermal resistance. **(08 Marks)**

Module-3

5 a. Explain the need for signal conditioning. **(08 Marks)**

b. Write a brief note on data acquisition. **(08 Marks)**

OR

6 a. Write a brief note on micro system packaging. **(08 Marks)**

b. Discuss the characteristics of Silicon as a substrate material for MEMS. **(08 Marks)**

Module-4

7 a. Explain briefly the following basic building block of a mechanical system :
   i) Springs
   ii) Damper **(08 Marks)**

b. Obtain the differential equation of a mechanical system with spring, damper and mass **(08 Marks)**

OR

8 a. Bring out clearly the analogy between mechanical and electrical system building blocks. **(08 Marks)**

b. Explain briefly about transient response of a system. **(08 Marks)**

Module-5

9 a. What is condition monitoring? Illustrate with an example. **(08 Marks)**

b. Explain briefly about wear behaivour monitoring. **(08 Marks)**

OR

10 a. Explain fault finding technique that are used with microprocessor based systems. **(08 Marks)**

b. Explain what is meant by i) Replication checks ii) Reversal checks. **(08 Marks)**

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