CBCS SCHEME

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16/17MDE153

First Semester M.Tech. Degree Examination, June/July 2018
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. Briefly explain the functions of a measurement system. **(06 Marks)**

b. With block diagram, explain the working of microprocessor controlled Automatic camera. **(10 Marks)**

OR

2 a. With neat sketch explain the working principle of Hall effect sensor. Give its applications. Explain any one application. **(10 Marks)**

b. Explain briefly any TWO mechanical actuators. **(06 Marks)**

Module-2

3 a. Explain the characteristics features of the following solid state switches :
   i) Thyristors and Traics
   ii) Bipolar Transistors. **(10 Marks)**

b. Explain permanent magnet stepper motor with a neat sketch. **(06 Marks)**

OR

4 a. Briefly explain with mathematical models the following Electrical system building blocks:
   i) R – C System
   ii) R – L – C System. **(10 Marks)**

b. Briefly explain Thermal Resistance and Thermal capacitance. **(06 Marks)**

Module-3

5 a. Briefly explain the signal conditioning processes. **(06 Marks)**

b. What are operational Amplifiers? List the characteristics of Op – Amps. Also illustrate the pin configuration of Op – Amps. **(10 Marks)**

OR

6 a. With mathematical expression, explain the principle of Logarithmic Amplifiers. **(10 Marks)**

b. With sketch, explain the process of Ion Implantation done on a substrate. **(06 Marks)**

Module-4

7 a. Derive an expression to describe how the height of liquid in the container depends on the rate of input of liquid in to the container. The system in as shown in Fig Q7(a).

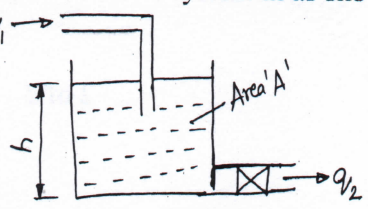

Fig Q7(a) **(08 Marks)**

b. With neat sketch, explain the basic elements of the magnetic recording head. **(08 Marks)**

OR

8 a. With neat sketch, explain how a double acting cylinder is controlled. **(08 Marks)**

b. Briefly explain the basic elements of a Laser printer. **(08 Marks)**

Module-5

9 a. Explain the fault finding Techniques associated with the microprocessor based systems. **(08 Marks)**

b. Briefly, explain the systematic fault location methods. **(08 Marks)**

OR

10 a. Explain the following :

i) Multiplexers

ii) Incremental Encoders. **(10 Marks)**

b. Write a note on any Two Temperature Sensors used. **(06 Marks)**

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