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20MCM12

First Semester M.Tech. Degree Examination, Jan./Feb. 2021
Mechatronics and Applications

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Discuss the mechatronic design approach. Mention the advantages and limitations of mechatronics. **(08 Marks)**
   b. Describe with a block diagram, the basic elements of a closed loop control system. **(08 Marks)**
   c. Explain briefly the evolution of mechatronics. **(04 Marks)**

OR

2 a. Explain the classification of a Sensor the Transducer. **(08 Marks)**
   b. Discuss the application of Incremental rotary encoder for position sensing and speed measurement with a block diagram. **(06 Marks)**
   c. Describe the application of photo emissive transducer for the measurement of intensity of light , with a neat sketch. **(06 Marks)**

Module-2

3 a. Differentiate between a microprocessor and microcontroller. **(06 Marks)**
   b. Discuss with neat block diagram of PIC microcontroller. Mention salient features. **(08 Marks)**
   c. Draw the pin diagram of 8051 microcontroller. **(06 Marks)**

OR

4 a. Explain briefly the classification of microcontroller. **(06 Marks)**
   b. Describe with a block diagram of 8051 microcontroller and mention salient features. **(08 Marks)**
   c. Discuss the Input / Output parts of 8051 microcontroller. **(06 Marks)**

Module-3

5 a. Discuss the developmental tools of Assembly language. **(08 Marks)**
   b. Describe the instructions for data exchange in microcontroller with example. **(06 Marks)**
   c. Explain the different types of Addressing modes of micro controller. **(06 Marks)**

OR

6 a. Explain the different types of logical operations performed in microcontroller. **(06 Marks)**
   b. Discuss briefly how microcontroller is interfaced to the keyboard. **(08 Marks)**
   c. Explain briefly how microcontroller is interfaced to A/D converter. **(06 Marks)**

Module-4

7 a. Explain briefly centralized and distributed control system with example. **(08 Marks)**
   b. Discuss with a block diagram, Open System Interconnection model (OSI model) and mention the different layers of OSI model. **(12 Marks)**

OR

8 a. With a functional block diagram, explain the serial communication interface. **(10 Marks)**

   b. Explain the serial communication protocol with a block diagram. **(10 Marks)**

Module-5

9 a. Describe with a block diagram, the working of Engine management system of 4 – stroke petrol engine. **(10 Marks)**

   b. Discuss with neat sketch, the working of Bar Code Reader. **(10 Marks)**

OR

10 a. Draw neat sketch of Automatic Camera system and briefly discuss the working of automatic camera. **(10 Marks)**

   b. Discuss the working principle of Hard disk drive system with a neat sketch. **(10 Marks)**

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