CBCS SCHEME

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First Semester M.Tech. Degree Examination, Feb./Mar. 2022
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. Define a mechatronic system. With the help of a block diagram, explain the elements of a measurement systems used in mechatronics. **(10 Marks)**
    b. What is meant by microprocessor based controllers? With the help of a suitable example, explain how a microprocessor is used to control the process. **(10 Marks)**

OR

2   a. Explain the working of the following temperature sensors with the help of a relevant sketch:
        (i)   Bimetallic strips
        (ii) Thermisters **(10 Marks)**
    b. What is meant by Hall effect? With a sketch, explain the working principle of Hall effect sensor used in the fluid level measurement. **(10 Marks)**

Module-2

3   a. Differentiate between microprocessor and microcontroller. Also list different criteria for the selection of a microcontroller for a particular application. **(10 Marks)**
    b. Write a short note on the different types of microcontroller based on the number of bits. Also mention advantages and disadvantages of each type. **(10 Marks)**

OR

4   a. Draw and explain the architecture of Intel 8051, a 8-bit microcontroller. **(10 Marks)**
    b. Explain pin configuration with circuit diagram for all port of 8051 microcontroller. **(10 Marks)**

Module-3

5   a. Explain different addressing modes of 8051 microcontroller with examples. **(10 Marks)**
    b. Write an assembly program to multiply two 16 bit numbers for 8051 controller. **(10 Marks)**

OR

6   a. Sketch and explain the interfacing diagram of ADC with 8051 microcontroller. **(10 Marks)**
    b. List the interrupts available in the 8051 microcontroller. Explain interrupt enable SFR and interrupt priority SFR. **(10 Marks)**

Module-4

7   a. Explain the requirements of an interface circuit. **(06 Marks)**
    b. Write a short note on input/output addressing. **(06 Marks)**
    c. What are peripheral interface adapters? With the help of a relevant diagram, explain the process of interfacing a stepper motor. **(08 Marks)**

OR

8   a.   Explain the different layers of open system interconnection communication model.(10 Marks)
      b.   Write a short note on the protocols and its types.   (10 Marks)

Module-5

9   In consideration with mechatronic design, explain the working of the following:
      a.   Timed switch
      b.   Windscreen wiper mechanism   (20 Marks)

OR

10   Elaborately explain the working of a following mechatronics system:
      a.   Car engine management system
      b.   Hard disk drive   (20 Marks)

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