CBCS SCHEME

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21ME653

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Mechatronics

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define Mechatronics. Explain with a neat sketch, the basic elements of a closed loop system. **(10 Marks)**

b. Explain with block diagram the working of an automated washing machine. **(10 Marks)**

OR

2 a. Define transducer. Explain primary and secondary transducer with example. **(10 Marks)**

b. Explain how does the following work:
i) Hall Effect Sensor (ii) Proximity sensor **(10 Marks)**

Module-2

3 a. With the help of block diagram, explain Data Acquisition System (DAQS). **(10 Marks)**

b. Explain the signal conditioning process. **(06 Marks)**

c. What is a filter? How are filters classified? **(04 Marks)**

OR

4 a. Define Solenoids. Explain two types of solenoids and mention their applications. **(10 Marks)**

b. Explain the working of variable reluctance stepper motor with neat sketch. **(10 Marks)**

Module-3

5 a. Explain with neat block diagram, the general form of Microprocessor system. **(10 Marks)**

b. What is Microcontroller? Distinguish between Microprocessor and Microcontroller. **(10 Marks)**

OR

6 a. With a neat sketch, explain 8085A Microprocessor architecture. **(10 Marks)**

b. Explain the following:
(i) Fetch cycle (ii) Types of buses (iii) Flag registers (iv) Program counter **(10 Marks)**

Module-4

7 a. Define PLC (Programmable Logic Controller). Explain with a neat diagram working of a PLC. **(10 Marks)**

b. Explain in detail the criteria used for selection of PLC. **(10 Marks)**

OR

8 a. Explain the control of two pneumatic pistons, with neat sketch. **(10 Marks)**

b. Explain, with ladder diagram, a latch circuit and an internal relay. **(10 Marks)**

Module-5

9 a. With a neat sketch, explain any three types of guide ways. **(10 Marks)**

b. Explain the working of hydrostatic bearing with neat sketch. **(10 Marks)**

OR

10 a. Explain the mechatronics design process with neat sketch. **(10 Marks)**

b. Design a mechatronic system for pick and place robot. **(10 Marks)**

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