Question Paper Code : 50888

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Seventh Semester

Mechanical Engineering

ME 6702 – MECHATRONICS

(Common to Manufacturing Engineering, Mechanical and Automation Engineering, Production Engineering)

(Regulations 2013)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions.

PART – A   **(10×2=20 Marks)**

1. What is a mechatronics system ?

2. How is 'resolution' of a sensor defined ?

3. What are the features of microprocessor ?

4. List various types of addressing modes used in the 8085 microprocessor ?

5. State the function of an Analog to Digital Converter (ADC).

6. Why is interfacing required ?

7. Why are PLC systems preferred over computers in factories ?

8. How is a latch circuit represented in a ladder diagram ?

9. What are the types of stepper motors ?

10. How a servo motor is controlled ?

PART – B (5×16=80 Marks)

11. a) i) What are the emerging areas of mechatronics ? (8)

    ii) Discuss the working principle and application of a potentiometer sensor. (8)

    (OR)

    b) How LVDT could be used for the following ? Draw and explain the arrangements.

    i) To measure fluid pressure in a system. (8)

    ii) To control the depth of drilled hole in a vertical drilling machine. (8)

12. a) i) What are the functions of address, data and data busses ? (8)

    ii) Draw the timing diagram of the instruction MOV A, B and explain the process. (8)

    (OR)

    b) Draw the architecture diagram of 8085 microprocessor and explain the functions of individual elements.

13. a) The temperature in a furnace has to be controlled using a microprocessor. Explain the arrangement with an illustration. Write an assembly language program for the temperature control.

    (OR)

    b) A stepper motor is controlled using a microprocessor. Explain the arrangement with an illustration. Write an assembly language program for controlling the stepper motor.

14. a) i) Draw the architecture of a PLC and explain the functions of its elements. (8)

    ii) Discuss PLC timer system with diagrams. (8)

    (OR)

    b) i) How is an internal relay used to start multiple outputs ? Discuss this with a ladder diagram. (8)

    ii) What are the factors considered in the selection of a PLC system ? Give examples. (8)

15. a) What are the seven stages of mechatronics design ? Discuss how they are applied to design a weighing machine with a digital output.

    (OR)

    b) i) Compare the traditional and mechatronics design of car windscreen wiper. (8)

    ii) A coin operated car park barrier is controlled using a PLC. Draw the ladder diagram for its operations. (8)

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