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Question Paper Code : X20851

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Seventh Semester

Mechanical Engineering

ME6702 – MECHATRONICS

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

(Regulations – 2013)

(Also Common to PTME 6702 – Mechatronics for B.E. (Part-Time) – Fifth
Semester – Mechanical Engineering – (Regulations – 2014))

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What are the classifications of mechatronics ?
2. Brief the working principle of Hall Effect Sensor.
3. Mention the various features of 8085 Microprocessor.
4. List the various types of addressing modes of 8051 Microcontroller.
5. Write the needs of data converter in mechatronics System.
6. Write the working principle of stepper motor.
7. How to select a PLC for your particular applications ?
8. Draw the latch circuit using PLC ladder logic.
9. Distinguish Traditional and Mechatronics Design concepts.
10. What are the applications of servo motors in Mechatronics Systems ?

PART – B

(5×13=65 Marks)

11. a) Explain various factors that emphasize need of Mechatronics Technology. **(13)**
(OR)
b) Explain the working principle, construction and applications of Eddy Current Sensor. **(13)**



12. a) Draw and explain the architecture of 8085 Microprocessor with a block diagram. **(13)**
(OR)
b) Sketch and explain the Timing diagram for the instruction IN 00. The opcode for IN is 'DB'. **(13)**
13. a) Explain block diagram, flow chart and program segment for the Microprocessor based temperature controller. **(13)**
(OR)
b) Design a hardware to interface 7 segment LED with 8085 microprocessor. Write a software to display a Number '9'. **(13)**
14. a) i) Sketch and explain the architecture of a PLC.
ii) Draw the Ex-NOR circuit using PLC ladder logic. **(10+3)**
(OR)
b) Explain the Input Output processing of a PLC with suitable ladder logic. **(13)**
15. a) Explain the Mechatronics based engine management system with a block diagram. **(13)**
(OR)
b) Explain the working principle, construction and advantages of servo motor. **(13)**
- PART – C** **(1×15=15 Marks)**
16. a) Discuss a case study about applications of pick and place robots in Mechatronics Systems. **(15)**
(OR)
b) Discuss a case study on Mechatronics based Automatic car park barrier with suitable circuit diagram. **(15)**
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