

22225

M.Tech. 1st Semester (ME)
Examination, December-2018

MACHINE DESIGN

Paper- M-809-A

Mechatronics and Product Design

Time allowed : 3 hours] [Maximum marks : 100

Note: Attempt any five questions.

1. Explain 4×5=20
 - (i) Closed loop control system
 - (ii) Where the PLC's are used?
 - (iii) Explain some advantages and limitations of Mechatronics.
 - (iv) What is difference between PLC and Logic card?
2. Explain Mechatronics. What are the key elements of Mechatronic system? Explain with examples. 20
3. (a) Give a comparison between analog type and digital type instruments. 2×10=20
(b) List any four types of sensors and mention their features.
4. Explain briefly a mathematical model of a car moving on a road. What is the work of Accumulator in 8085? 20
5. Derive a differential equation for hydraulic mechanical system of lifting load. Explain the design stages in Mechatronics. 20

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6. Explain the working of ball screws, solenoids, line actuators and controllers in CNC machines. 20
7. Draw the circuit of a counter type A/D convertor and explain its operation. 20
8. (a) What are the two types of feed back loop? $4 \times 5 = 20$
 - (b) Tactile sensor.
 - (c) LVDT
 - (d) Relays

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