Seat
No.

B.E. (Mechanical) (Part - II) (Semester - VIII) Examination, April - 2016
MECHATRONICS (Revised) (New)
Sub. Code : 49417

Day and Date : Sunday, 17 - 04 - 2016

Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 100

Instructions :
1) Answer any three questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state clearly.

SECTION - I

Q1) a) Define Mechatronics. Explain the integration of various systems w.r.t. pick and place robot. **[8]**

b) Differentiate between microprocessor and microcontroller. **[8]**

Q2) a) Suggest suitable sensors for sensing following quantities; also state the transduction principle of the sensor suggested by you. **[8]**

     i) Acceleration

     ii) Temperature

     iii) Fluid level

     iv) Displacement

b) What are different signal conditioning processes? Explain any one in detail. **[8]**

Q3) a) Draw a labeled diagram of architecture of microprocessor (μP)-8085. **[8]**

b) Explain in detail the terms related to interfacing input output ports. **[8]**

P.T.O.

Q4) Write notes on (any three) : [18]

    a) Boolean Algebra

    b) Flip flops

    c) Op-Amp as summing amplifier

    d) Multiplexing

    e) Number systems in digital logic

SECTION - II

Q5) a) Draw a labeled block diagram of PLC and explain each component in detail. [8]

    b) Define Programmable Logic Controller (PLC). State the advantages, limitations and applications of PLC. [8]

Q6) a) In a PLC based automatic ball sorting system, there are three types of balls viz. metal, plastic and glass, are to be sorted. If metallic ball is sensed, actuator A 1 will be actuated and will retract touching the limit switch LS1. If plastic ball is sensed, actuator A2 will be actuated and will retract touching the limit switch LS2. If the ball is of glass, no actuators would be actuated. When the balls in the hopper are reduced below low level, a RED Light should glow along with a buzzer so the operator would fill it to get a continuous sorting operation. [8]

    b) Explain Up counter and Down counter with the symbol and applications. [8]

Q7) a) For a PLC based tea and coffee vending machine explain the role of following elements : [8]

    i) Timers

    ii) Counters

    iii) Internal Relays

    b) Explain Physical components Vs Program components with the help of example. [8]

Q8) Write notes on (any three) :   [18]

    a)   Fail Safe Circuit

    b)   Symbols used in ladder programming with addressing

    c)   Disagreement circuit and Latching circuit

    d)   AND-OR and OR-AND circuit

    e)   Selection criteria for PLC

● ● ●