Total No. of Questions : 12] SEAT No. :

P4273

[Total No. of Pages : 2

[4759] - 116
B.E. (Electronics) (Semester - I)
MECHATRONICS
(2013 Pattern) (Elective- I)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer questions 1 or 2 ,3 or 4, 5 or 6, 7 or 8, 9 or 10, 11 or 12.***
2) ***Answers to the two sections should be written In separate answer books. Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Define the term mechatronics. Explain the role of mechatronics in design of elevator system in detail. **[10]**

b) Explain different types of errors involved in the measurement system. How to reduce these errors. **[8]**

Q2) a) Justify with suitable examples scope and importance of mechatronics with respect to interdisciplinary approach. **[10]**

b) Explain the term static characteristics and dynamic characteristics. Explain the terms: **[8]**

i) Speed of response

ii) Measuring lag

iii) Fidelity.

Q3) a) Define the term pressure. What are the units used in pressure measurement. Explain in detail LVDT for pressure measurement. **[8]**

b) A strain gauge with a gauge factor of 4 has a resistance of 120Ω when unstrained. If strain gauge undergoes a change in length from 0.25mm to 0.255mm. Find the new value of resistance. **[8]**

Q4) a) Explain position measurement system using ultrasonic method. **[8]**

b) Write a short note on proximity sensors. **[8]**

P.T.O.

Q5) a) What are the important specifications of ADC and DAC. Explain them. **[8]**

b) Define the term PLC. List the different specifications of PLC. Which different inputs and outputs used in PLC. **[8]**

Q6) a) Write a short note on AD 633. **[8]**

b) It is required to measure and control water flow through closed pipeline from 0-100 ltrs/hr. Design and explain control system using PIC microcontroller to control flow. Justify selection of components. **[8]**

SECTION - II

Q7) a) Explain multichannel data logger system in detail. **[8]**

b) Write a short note on HART protocol. **[8]**

Q8) a) With suitable diagram explain principle and working of magnetic recorder. **[8]**

b) Explain RS232 standard in detail. **[8]**

Q9) a) Define the term actuator. Explain electro pneumatic actuator in detail. **[8]**

b) Define the control valve. Explain different factors for selection of control valve. **[8]**

Q10)a) List the different specifications of stepper motor. Explain in detail stepper motor as electrical actuator. **[8]**

b) Explain construction and working of double acting cylinder. **[8]**

Q11)a) Explain mechanical and electronic design in detail for robot walking machine. **[10]**

b) Explain in detail skip control of CD player. **[8]**

Q12)a) A electronics weighing machine is used to measure 0-50kg of weight. Design weighing machine system by using strain gauge. Justify the selection of components. **[10]**

b) Explain mechatronics design of a coin counter. **[8]**