Total No. of Questions : 6] **SEAT No. :**

P5077 **[Total No. of Pages : 2**

T.E./Insem.-625
T.E. (E & TC)
MECHATRONICS
(2015 Pattern) (Semester - I)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data, if necessary.***

Q1) a) What is Conventional and Integrated approach in mechatronics design? **[5]**

b) Explain Audio CD Player control system as an example of Mechatronics systems. **[5]**

OR

Q2) a) Explain case study of Design of Coin Counter / Coin Separator as an example of mechatronics system. **[5]**

b) Sensitivity of a thermocouple is 0.01 V/o_C. Find output voltage if the temperature is 200ºC. Also temperature for 3.5V output? **[5]**

Q3) a) What are the proximity sensors used in Industry? Explain photoelectric proximity sensors. **[5]**

b) Explain basic principle of working of ultrasonic transducer for flow measurement? What are its advantages and limitations? **[5]**

OR

P.T.O.

Q4) a) A resistance wire strain gauge with a GF of 2.0 is bonded to a steel structural member subjected to a stress of 100 MN/m^2. The modulus of elasticity of steel is 200 GN/M^2. Find the percentage change in the value of the gauge resistance, due to applied stress. Comment upon the results. **[5]**

b) Write a short note on Smart Sensors used in mechatronics applications? Explain it with schematic representation. **[5]**

Q5) a) Draw schematic of typical hydraulic system used in Mechatronics applications. **[4]**

b) Draw Schematic of hydraulic actuator systems. The hydraulic cylinder is of 1cm radius. Find the force exerted on the piston if the pressure is 200N. **[6]**

OR

Q6) a) Explain significance of hydraulic pumps in typical hydraulic systems. **[5]**

b) Draw schematic of filters and pressure regulator in hydraulic systems. **[5]**