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

P16 **[Total No. of Pages : 2**

TE/INSEM/APR-19
T.E. (Mech.) (Semester - II)
302050 : MECHATRONICS
(2015 Pattern)

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) ***Figures to the right indicate full marks.***
4) ***All questions carry equal marks.***
5) ***Assume suitable data, if necessary.***
6) ***Use of electronic pocket calculator and steam tables is allowed.***

Q1) a) Explain need for mechatronics in mechanical industries. **[6]**

b) For temperature measuring sensor, input is temperature and output is volt. **[4]**

The sensor Transfer Function (TF) is given as 0.01 volt/degree.

Find :

i) Sensor output voltage if temperature is 600°F

ii) Temperature for 3.5 V.

OR

Q2) a) A linear resistance potentiometer is 50mm long and uniformly wound with wire having resistance of 10KΩ. Under normal conditions, the slider is at the centre of the potentiometer. Find the linear displacement when the resistance of the potentiometer is (i) 3850Ω (ii) 7560Ω. If minimum measurable resistance is 10Ω. Comment on the displacement direction. Find the resolution of potentiometer in mm. **[6]**

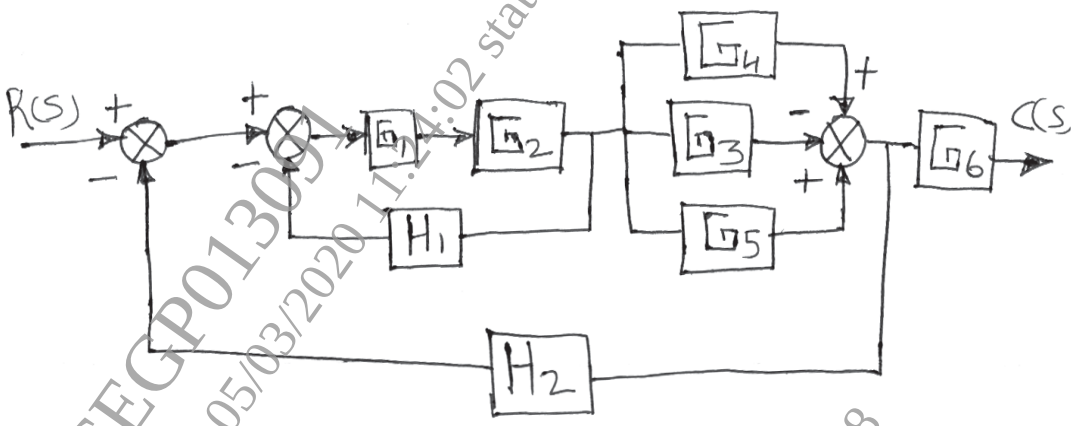
b) Define : **[4]**

i) Resolution

ii) Sensitivity.

P.T.O.

Q3) a) Obtain $C(S)/R(S)$ using block reduction rule. **[6]**

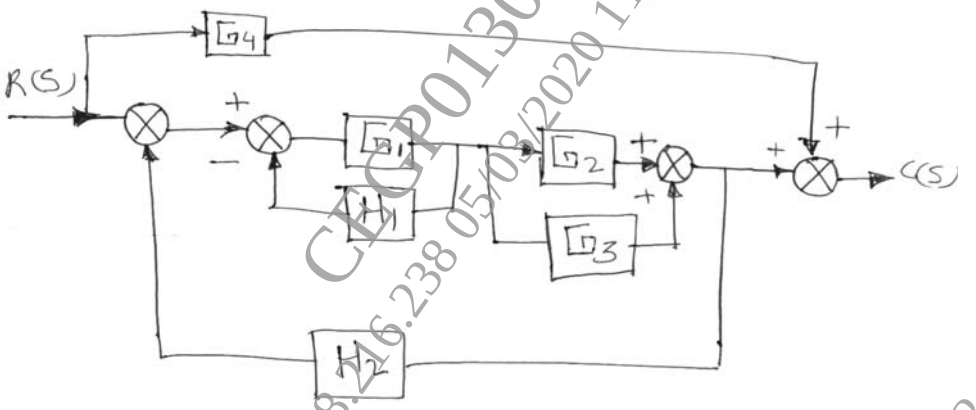


b) Explain any one Automotive application of mechatronics system. **[4]**

OR

Q4) a) Explain concept of Transfer function. **[4]**

b) Reduce the following Block diagram into single Block diagram. **[6]**



Q5) a) Explain in detail Analog to digital conversion process. **[6]**

b) A 4-bit DAC has reference voltage of 8V. The binary input is 1101. Find the analog output voltage. **[4]**

OR

Q6) a) Compare parallel and serial communication. **[4]**

b) A 4-bit R-2R type DAC is supplied with 2.56 volt reference potential. Determine the full scale output potential and LSB. **[6]**

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