Computer Systems Engineering Department
Interfacing Techniques ENCS436
Homework#2

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Question#1)

A temperature measuring system, with a time constant 2 s, is used to measured temperature of a heating medium, which changes sinusoidal between 350 and 300C with a periodic of 20 s. find the maximum and minimum values of temperature, as indicated by the measuring system and the time lag between the output and input signals

Question#2)

The approximate time constant of a thermometer is determined by immersing it in a bath and noting the time it takes to reach 63% of the final reading. If the result is 28 s, determine the delay when measuring the temperature of a bath that is periodically changing 2 times per minute

Question#3)

An Accelerometer is selected to measure a time-dependent motion. In particular, input signal frequencies below 100 Hz are of prime interest. Select a set of acceptable parameter specifications for the sensor (i.e. $\omega_{n)}$, assuming a dynamic error of ±5% and damping ratio ζ =0.7. Use Matlab to verify your results.

Question#4)

Discuss different types of acceleration sensors and Gyroscopes exists today, i.e. in your smart phone. I expect to do the following:
-Discuss concept of operation of the sensor
-Technology used in manufacturing it
-Static and dynamic characteristics of the sensor
-Simple interface to take some measurements from the sensor.

Good Luck