

Problem I (10 Points)

- The sensitivity of a pressure measuring instrument has the following calibration curve is:

- If the same instrument is used to measure an input pressure of (60 kPa) the output voltage will be:

- a. 18 mV b. 60 V c. -18 V **d. 18 V**

- If the same instrument was used to measure pressure values of (0, 10, 20, and 30 kPa) at a different location and gave the results shown in figure (square markers). The error shown represents:

- a. A (2V) Zero Drift b. A (2V) Sensitivity Drift **c. A (-2V) Zero Drift** d. A (-2V) Sensitivity Drift

- You cannot calibrate a measuring device by comparing it to:

- a. A Primary Standard.

- b. A Known Input source.

- c. A Secondary Standard with lower accuracy.**

- d. A carefully planned experiment.

- A first order measuring system is governed by the equation $(5p_i = 2 dx/dt + 5x)$, the time constant for the system is:

- a. 1 b. 2.5 c. 5 **d. 0.4**

- Zero Drift can be classified as:

- a. Systematic error.** b. Random Error. c. Threshold. d. Calibration Error.

- A temperature measurement device has a systemic error of 0.03 °C and a random error of 0.1 °C if it was used to measure a temperature of (T=25 °C) the reading should be represented (in terms of relative error f) as:

- a. $(25 \pm 0.13)\%$ b. $25 \pm 0.52\%$ c. $(25 \pm 0.104)\%$ **d. $25 \pm 0.42\%$**

- Instruments available at strength lab of materials will have a calibration level of:

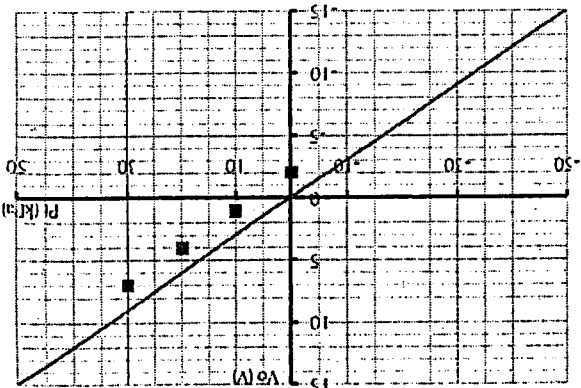
- a. Primary Standard b. Secondary Standard c. Laboratory Standard **d. Working Standard**

- A sample of 30 repeated temperature readings has a mean of 34.5 °C and a standard deviation of 0.05 the reported temperature should be written as (use 99.7% confidence criteria):

- a. $(34.5 \pm 0.15)\%$** b. 34.5°C c. $(34.5 \pm 0.05)\%$ d. $(34.5 \pm 0.10)\%$

- For the same sample in Q9 how many readings will fall within the interval (34.4, 34.6) if the sample is proven to follow normal distribution

- a. 30 readings **b. 21 readings** c. 15 readings d. cannot be determined



sample exam