INTEGRAL UNIVERSITY
EC-501 MEASUREMENT AND INSTRUMENTATION
ASSIGNMENT NO.1

Q1). a). Define Calibration. Why calibration of instruments is done?
b). (i). Discuss the Classification of Standards.

(ii). Discuss IEEE Standards.

Q2). a). Define Transduser. Discuss the operation of piezoelectric transducer using neat labeled diagram.

b).Discuss instrumentation system with a block diagram.

Q3). a). Differentiate between Accuracy and Precision with suitable examples.

b). A moving coil voltmeter has a uniform scale with 100 divisions, the full scale reading is 200V, and 1/10 (one-tenth) of the scale can be estimated with fair degree of certainty. Determine the resolution of the instrument in volts.

Q4). a). Discuss briefly the types of Errors & their minimization techniques.

b). Explain the working of LVDT with a neat diagram.

Q5). (i). A voltmeter having a sensitivity of 1000Ω/V, reads 100V on its 150V scale when connected across an unknown resistor in series with a milliammeter, when the milliammeter reads 5mA, calculate:

(a). the apparent resistance of the unknown resistor,

(b). the actual resistance of the unknown resistor,

(c). the error due to loading effect of the voltmeter.

(ii). Repeat ques 5(i), if milliammeter reads 800mA and the voltmeter reads 60V on its 150V scale.

Q6) (i). What is limiting error? Explain.

(ii). a). A 0 to 150V voltmeter has a guaranteed accuracy of 1% full scale reading. The voltage measured by this instrument is 83 volts. Calculate the limiting error in percentage.

b). The current passing through a resistor of 100±0.2Ω is 2.00±0.01A. Using the relationship P=I^{2}R, calculate the limiting error, in the computed value of power dissipated.

Q7. a). Write the balanced condition for Hay's Bridge. Write its advantages and disadvantages.
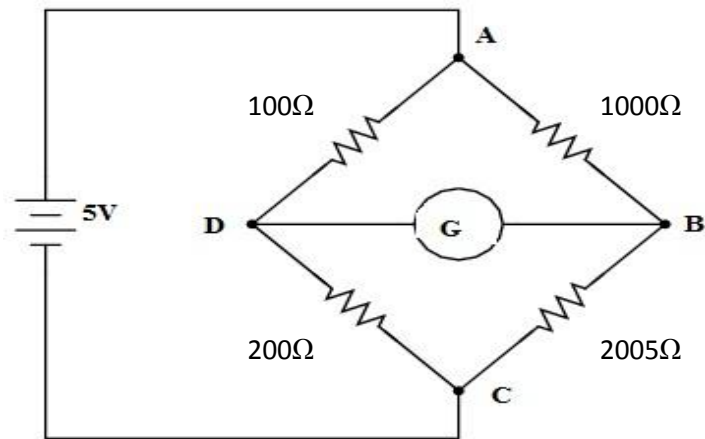
b).

Figure shows the schematic diagram of a Wheatstone bridge with values of the bridge elements as shown. The battery voltage is 5V and its internal resistance is negligible. The galvanometer has a current sensitivity of 10 mm/µA and an internal resistance of 100 Ω. Calculate the deflection of the galvanometer caused by the 5 Ω unbalance in arm BC.