Instrumentation & Measurements Exercise
Chapter 1: Introduction to Instrumentation & Measurements

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1.1 Principle of Instrumentation & Measurements

Question 1: Complete the following table

Quantity	Symbol	Unit	Unit Abbre.
	l	meter	
Capacitance			F
Time		second	
	T	Kelvin	K
Charge			

1.2 Error in Measurement

Question 2: The expected value of the voltage across a resistor is 10V. However, measurement yields a value of 8.0 V. Calculate:

a) Absolute error
b) % error
c) Relative accuracy
d) % accuracy

1.2 Error in Measurement

Question 3: A 300V voltmeter is specified to be accurate within ±2% at full scale. Calculate the limiting error when the instrument is used to measure a 120V source?

Question 4: A voltmeter and an ammeter are to be used to determine the power dissipated in a resistor. Both instruments are guaranteed to be accurate within ±1% at full scale. If the voltmeter reads 80V on its 150V range and the ammeter reads 70mA on its 100mA range, calculate the limiting error for the power calculation.

1.2 Error in Measurement

Question 5: Table below gives the set of 10 measurement that were recorded in the laboratory. Calculate the precision of the 6th measurement.

Measurement number	Measurement value X_n
1	98
2	101
3	102
4	97
5	101
6	100
7	103
8	98
9	106
10	99

1.2 Error in Measurement

Question 6: For the following data, compute

a) The arithmetic mean

b) The deviation of each value

c) The algebraic sum of the

d) The average

e) The standard deviation

$x_1 = 50.1$ $x_2 = 49.7$

$x_3 = 49.6$ $x_4 = 50.2$

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Thank you to all past lecturers of

Instrumentation & Measurement

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