Measurement Errors and Statistics

Total Questions: 7

Most Correct Answers: **#5**

Least Correct Answers: **#6**

1. Systematic errors:

5/20 (A) ...describe the whole error of any system.

8/20 (B) ...can (in principle) be compensated.

5/20 (C) Their influence can be reduced by averaging.

6/20 (D) The reason for such errors can be known.

2. Random errors:

0/20 (A) ...are generated by random number generators.

7/20 (B) Their influence can be reduced by averaging.

12/20 (C) The reason for such errors is unknown.

9/20 (D) ...represent deterministic irregularities.

3. Static errors:

9/20 (A) ...may arise from nonlinear sensor characteristics.

12/20 (B) ...may arise from linear sensor characteristics.

9/20 (C) ...can be avoided, if the sensors are mounted properly.

10/20 (D) ...can also occur when dealing with analog signals.

4. Dynamic errors:

11/20 (A) ...may occur when dealing with digital or analog signals

13/20 (B) ...vanish after the steady state is reached.

7/20 (C) ...arise from quantization.

6/20 (D) ...only occur when dealing with digital signals.

5. Histograms:

9/20 (A) ...converge to the probability density function for infinitely small intervals and an infinite number of measurements.

5/20 (B) ...converge to the cumulative density function for infinitely small intervals and an infinite number of measurements.

5/20 (C) ...describe the history of measured data.

1/20 (D) ...are only reasonable to represent Gaussian distributed data.

6. Bias of Estimators:

10/20 (A) Unbiased estimators yield the true mean value for an infinite number of measurements.

6/20 (B) Unbiased estimators yield the correct expected value for a finite number of measurements.

9/20 (C) An estimator's bias influences its variance.

12/20 (D) An estimator's bias can be reduced through more measurements.

7. Variance of Estimators

12/20 (A) An estimator's variance can be reduced through more accurate sensors.

10/20 (B) An estimator's variance can be reduced through more measurements.

5/20 (C) Are usually known.

10/20 (D) Biased estimators yield the true variance for an infinite number of measurements.