Measurement & Experimentation Lab MCQ

Measurement Lab. MCQ

Author: Steve Gibbs
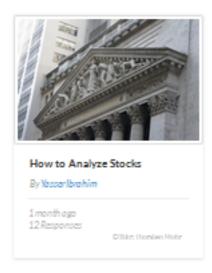
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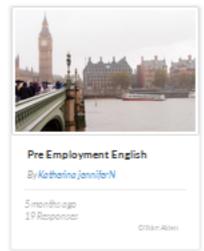
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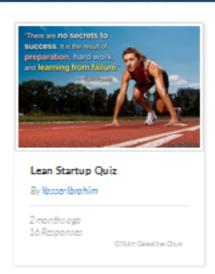
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Table of Contents

4. Chapter: Unit 03: Electrical Circuits and Data Acquisition

4.1.1. A 12 bit ADC may have _____ unique output conditions.

Author: Steve Gibbs

A 12 bit ADC may have _____ unique output conditions.

Please choose only one answer:

- 2^{11}
- 2^{10}
- 12^{2}
- 12^{10}
- 2^{12}

Check the answer of this question online at QuizOver.com:
Question: A 12 bit ADC may have unique output conditions Steve @The Saylor

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4.1.2. A 6dB attenuator and a 50dB attenuator in series provide a total at...

Author: Steve Gibbs

A 6dB attenuator and a 50dB attenuator in series provide a total attenuation of

Please choose only one answer:

- 300dB
- 56dB
- 5.4dB
- 50dB
- None except this

Check the answer of this question online at QuizOver.com:
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4.1.3. A current source _____

Author: Steve Gibbs

A current source _____

Please choose only one answer:

- Can supply an infinite current upon demand.
- Supplies a constant current regardless of voltage within practical limits
- Is the source in use at the present
- Can supply AC or DC upon demand
- Supplies current varying linearly with the output voltage

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4.1.4. A digital signal _____

Author: Steve Gibbs

A digital signal _____

Please choose only one answer:

- Is represented by numbers ranging from 1 to 10
- Corresponds to the output of digital-to-analog converter
- Is represented by 10 bits of data
- Takes on discrete values over a range
- None of the above

4.1.5. A signal (in the context of this course) is_____

Author: Steve Gibbs

A signal (in the context of this course) is_____

Please choose only one answer:

- An indication to start or stop an activity
- An unexpected event
- An electrical current
- A detectable quantity used to communicate information
- None except this

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4.1.6. A simple way to filter out low frequencies is to place _____

Author: Steve Gibbs

A simple way to filter out low frequencies is to place _____

Please choose only one answer:

- An inductor in series with the load
- A capacitor in parallel with the load
- A capacitor in series with the load
- A rapid switch in series with the load
- None except this

Check the answer of this question online at QuizOver.com:
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4.1.7. AC amplitude may be measured by_____

Author: Steve Gibbs

AC amplitude may be measured by_____

Please choose only one answer:

- Frequency
- Period
- Frequency and period
- Duration
- Peak-to-peak, RMS, or average amplitude

4.1.8. Aliasing in signal digitization occurs when_____

Author: Steve Gibbs

Aliasing in signal digitization occurs when_____

Please choose only one answer:

- A signal is digitized too rapidly
- A signal is not digitized rapidly enough
- A signal is not digitized with enough amplitude resolution
- A connection is mislabeled
- All including this

4.1.9. Alternating current _____

Author: Steve Gibbs

Alternating current _____

Please choose only one answer:

- Oscillates at 60 Hz
- Changes amplitude with time
- Is always positive
- Decays with time
- None except this

4.1.10. A filter is an AC circuit that separates signals based upon _____

Author: Steve Gibbs

A filter is an AC circuit that separates signals based upon _____

Please choose only one answer:

- Amplitude
- Voltage
- Frequency
- Time
- Duration

4.1.11. A power gain of 30 dB corresponds to a factor of _____

Author: Steve Gibbs

A power gain of 30 dB corresponds to a factor of _____

Please choose only one answer:

- 10
- 30
- 100
- 1000
- 3000

4.1.12. A low-pass filter permits the passage of

Author: Steve Gibbs

A low-pass filter permits the passage of

Please choose only one answer:

- Low frequency signals
- Small voltages
- Small currents
- DC signals
- All including this

Check the answer of this question online at QuizOver.com:
Question: A low-pass filter permits the passage Steve Gibbs Saylor Foundat

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4.1.13. The nomenclature "live zero" indicates _____

Author: Steve Gibbs

The nomenclature "live zero" indicates _____

Please choose only one answer:

- A drifting baseline
- A fluctuating digital readout
- A non-zero rest state for an analog signal
- A faulty digital readout
- None except this

Author: Steve Gibbs

Three resistors (R[sub]1[/sub], R[sub]2[/sub], R[sub]3[/sub]) in series present a total resistance of_____

Please choose only one answer:

- R[sub]1[/sub] + R[sub]2[/sub] + R[sub]3[/sub]
- 1/R[sub]1[/sub] + 1/R[sub]2[/sub]+1/R[sub]3[/sub]
- R[sub]1[/sub]xR[sub]2[/sub]xR[sub]3[/sub]/(R[sub]1[/sub]+R[sub]2[/sub]+R[sub]3[/sub])
- R[sub]1[/sub]/R[sub]2[/sub] + R[sub]2[/sub]/R[sub]3[/sub] + R[sub]3[/sub]/R[sub]1[/sub]
- None except this

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Question: Three resistors R sub 1 /sub R sub 2 /sub R Steve Gibbs @The Saylor

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4.1.15. An analog signal _____.

Author: Steve Gibbs

An analog signal _____.

Please choose only one answer:

- Is continuously variable over a range
- Takes on a finite number of discrete values
- Is measured in units of electrical current or flow rate
- Is measured by voltage
- Is determined continuously in time

Check the answer of this question online at QuizOver.com:
Question: An analog signal . Steve Gibbs @The Saylor Foundat Measurement Quest

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4. Chapter: Unit 06: Time Measurements

1. Unit 06: Time Measurements Questions

4.1.1. A human-operated stop watch may be expected to be precise to within...

Author: Steve Gibbs

A human-operated stop watch may be expected to be precise to within_____.

Please choose only one answer:

- 10 ms
- 50 ms
- 300 ms
- 1 s
- 5 s

4.1.2. A typical human reaction time is on the order of_____.

Author: Steve Gibbs

A typical human reaction time is on the order of_____.

Please choose only one answer:

- 200 ms
- 500 ms
- 10 ms
- 50 ms
- 1 s

4.1.3. The current standard for time measurement is accurate to one part i...

Author: Steve Gibbs

The current standard for time measurement is accurate to one part in_____.

Please choose only one answer:

- 10 [sup]5[/sup]
- 10[sup]10[/sup]
- 10[sup]15[/sup]
- 10[sup]50[/sup]
- 10[sup]25[/sup]

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Question: The current standard for time measurement is Steve Gibbs Saylor Experimentation

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4.1.4. The fastest chemical reactions can take place on time scales of____...

Author: Steve Gibbs

The fastest chemical reactions can take place on time scales of_____.

Please choose only one answer:

- ps
- ns
- ms
- s
- fs

4.1.5. The time required for light or other electromagnetic signals to tra...

Author: Steve Gibbs

The time required for light or other electromagnetic signals to travel 1 m is approximately_____.

Please choose only one answer:

- 1 ms
- 1×10^{-9} s
- 1×10^{-23} s
- 1×10^{-5} s
- 1×10^{-60} s

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4. Chapter: Unit 02: Graphical and Tabular Data Presentation

1. Unit 02: Graphical and Tabular Data Presentation Questions

4.1.1. A temperature probe provides the following data as a function of ti...

Author: Steve Gibbs

A temperature probe provides the following data as a function of time (T(C), t(s)): (99, 2.0), (92, 11.0), (91,13.5), (85,17.0), (78,41), (69, 45), (46, 68), (49,112). Plot the data. You may use a spreadsheet or other data analysis system. Extrapolate to find the temperature at t=0s.

Please choose only one answer:

- 110 C
- 97 C
- 90 C
- 125 C
- 85 C

Author: Steve Gibbs

A temperature probe provides the following data as a function of time (T(C), t(s)): (99, 2.0), (95, 11.0), (91,13.5), (85,17.0), (78,41), (69, 45), (46, 68), (49,112). Plot the data. You may use a spreadsheet or other data analysis system. Interpolate to find the temperature at 80s.

Please choose only one answer:

- 60 C
- 65 C
- 55 C
- 45 C
- 40 C

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Question: A temperature probe provides the following Steve Gibbs Saylor Measurement

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4.1.3. A temperature probe provides the following data as a function of ti...

Author: Steve Gibbs

A temperature probe provides the following data as a function of time (T(C), t(s)): (99, 2.0), (95, 11.0), (91,13.5), (85,17.0), (78,41), (69, 45), (46, 68), (49,112). Plot the data. You may use a spreadsheet or other data analysis system. Which data pair deviates most from the least-squares line?

Please choose only one answer:

- 99, 2
- 95, 11
- 85, 17
- 78, 41
- 69, 45

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Author: Steve Gibbs

A temperature probe provides the following data as a function of time (T(C), t(s)): (99, 2.0), (95, 11.0), (91,13.5), (85,17.0), (78,41), (69, 45), (46, 68), (49,112). Plot the data. You may use a spreadsheet or other data analysis system. What is the least-squares slope of the data?

Please choose only one answer:

- 0.51 degrees C/s
- -0.51 degrees C/s
- 96 degrees C/s
- 1.9 degrees C/s
- -1.9 degrees C/s

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Question: A temperature probe provides the following Steve Gibbs Saylor Measurement

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4. Chapter: Unit 05: Measurement of Linear Dimension

4.1.1. Calipers enable measurements of lengths finer than_____.

Author: Steve Gibbs

Calipers enable measurements of lengths finer than_____.

Please choose only one answer:

- m
- mm
- nm
- cm
- fm

Check the answer of this question online at QuizOver.com:
Question: Calipers enable measurements of lengths finer Steve Gibbs @The Measurement

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4.1.2. Equipment may be machined to tolerances approaching_____.

Author: Steve Gibbs

Equipment may be machined to tolerances approaching_____.

Please choose only one answer:

- m
- mm
- nm
- cm
- pm

4.1.3. Molecular dimensions are on the order of_____.

Author: Steve Gibbs

Molecular dimensions are on the order of_____.

Please choose only one answer:

- nm
- mm
- cm
- pm
- fm

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4.1.4. Visible light microscopy can view features as small as a few_____.

Author: Steve Gibbs

Visible light microscopy can view features as small as a few_____.

Please choose only one answer:

- mm
- pm
- nm
- m
- fm

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4. Chapter: Unit 08: Temperature Measurements

Author: Steve Gibbs

A newscast reports that the temperature at the surface of a newly discovered planet orbiting a distant star is -502 degrees Fahrenheit. What is wrong with this claim?

Please choose only one answer:

- One cannot measure temperatures from a distance.
- There is no temperature measure in a vacuum.
- The reported temperature is below absolute zero.
- The temperature should be reported in degrees Kelvin.
- None except this

Check the answer of this question online at QuizOver.com:
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4.1.2. A thermocouple produces a_____.

Author: Steve Gibbs

A thermocouple produces a_____.

Please choose only one answer:

- Temperature-dependent voltage
- Temperature-dependent resistance
- Temperature-dependent mass
- Temperature-dependent capacitance
- None of the above

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Question: A thermocouple produces a . Steve Gibbs @The Saylor Foundat Measurement

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4.1.3. The temperature of the healthy human body in degrees C is_____.

Author: Steve Gibbs

The temperature of the healthy human body in degrees C is_____.

Please choose only one answer:

- 98.6
- 32
- 40
- 100
- 37

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4.1.4. If we wish to have a very fast temperature sensor, we should be con...

Author: Steve Gibbs

If we wish to have a very fast temperature sensor, we should be concerned with_____.

Please choose only one answer:

- The specific heat capacity of the materials used in constructing the sensor
- The rate at which the sensor output is sampled
- The mass of the sensor
- The thermal conductivity of the sensor
- All of the above

Check the answer of this question online at QuizOver.com:
Question: If we wish to have a very fast temperature Steve Gibbs @The Saylor

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4. Chapter: Unit 07: Force, Torque, and Pressure Measurements

1. Unit 07: Force, Torque, and Pressure Measurements Questions

4.1.1. A column of mercury 1 m high exerts a pressure equivalent to _____.

Author: Steve Gibbs

A column of mercury 1 m high exerts a pressure equivalent to _____.

Please choose only one answer:

- 33 ft water
- 9.8 ft water
- 45 ft water
- 12 ft water
- 760 psi

Check the answer of this question online at QuizOver.com:
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4.1.2. A force of 1 Newton is approximately equal to_____.

Author: Steve Gibbs

A force of 1 Newton is approximately equal to_____.

Please choose only one answer:

- 9.8 lb[sub]f[/sub]
- 32.2 lb[sub]f[/sub]
- 0.225 lb[sub]f[/sub]
- 4.448 lb[sub]f[/sub]
- 0.138 lb[sub]f[/sub]

Check the answer of this question online at QuizOver.com:
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4.1.3. A mass of 60 lb[sub]m[/sub] at the end of a yard-long pipe exerts a...

Author: Steve Gibbs

A mass of 60 lb[sub]m[/sub] at the end of a yard-long pipe exerts a torque of ___ at the pivot at the other end of the pipe

Please choose only one answer:

- 122 Nm
- 244 Nm
- 980 Nm
- 2440 Nm
- 1220 Nm

4.1.4. A strain gauge increases resistance by 0.08 Ohm/mm of extension at ...

Author: Steve Gibbs

A strain gauge increases resistance by 0.08 Ohm/mm of extension at 20 degrees C. An increase of 0.023 Ohms in resistance indicates a strain of_____.

Please choose only one answer:

- 0.124 mm
- 0.288 mm
- 0.300 mm
- 0.385 mm
- 0.060 mm

4.1.5. A torque of 25 lbft is equivalent to_____.

Author: Steve Gibbs

A torque of 25 lbft is equivalent to_____.

Please choose only one answer:

- 34 Nm
- 30 Nm
- 32 Nm
- 9.8 Nm
- 160 Nm

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Author: Steve Gibbs

A vendor reports that a vacuum pump can provide 25 psi of vacuum relative to the earth's atmospheric pressure. What is wrong with this claim?

Please choose only one answer:

- The vendor does not specify gauge or absolute pressure.
- The vendor does not specify static or dynamic pressure.
- The vendor does not use SI units.
- The vendor claims a specification with a negative absolute pressure.
- All including this

Check the answer of this question online at QuizOver.com:
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Author: Steve Gibbs

Mattias's mass is 85.2 kg. His mass in lb[sub]m[/sub] is approximately_____.

Please choose only one answer:

- 188 lb[sub]m[/sub]
- 37.9 lb[sub]m[/sub]
- 32.2 lb[sub]m[/sub]
- 225 lb[sub]m[/sub]
- 204.5 lb[sub]m[/sub]

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4. Chapter: Unit 01: Scientific Notation, Data Analysis, and Experimental Error

1. Unit 01: Scientific Notation, Data Analysis, and Experimental Error Questions

Author: Steve Gibbs

Madje can measure lengths to within 200 $$\mu$$m (standard deviation) using a custom ruler and magnifier. She measures the lengths of the base of a rectangle and the height of a rectangle to be 13.25 and 11.15 cm. What are the area and estimated standard error of that area?

Please choose only one answer:

- 147.7 +/- 4.0 cm[sup]2[/sup]
- 147.74 +/- 3.46 cm[sup]2[/sup]
- 147.74 +/- 0.40 cm[sup]2[/sup]
- 14.74 +/- 0.04 cm[sup]2[/sup]
- 147.74 +/- 0.04 cm[sup]2[/sup]

Check the answer of this question online at QuizOver.com:
Question: Madje can measure lengths to within 200 mu Steve Gibbs @The Saylor

Flashcards:
http://www.quizover.com/flashcards/madje-can-measure-lengths-to-within-200-mu-steve-gibbs-the-saylor?pdf=1505

Interactive Question:
http://www.quizover.com/question/madje-can-measure-lengths-to-within-200-mu-steve-gibbs-the-saylor?pdf=1505

Author: Steve Gibbs

Pablo measures the diameter of a cylinder to be $$11.91 \pm 0.05 \, \,{\tt{mm}}$$. What is the area of the cylinder. Remember that there is only one independent measure of the diameter.

Please choose only one answer:

- 111.4 +/- 0.935 mm[sup] 2 [/sup]
- 11.4 +/- 0.09 mm [sup] 2 [/sup]
- 111.4 +/- 0.094 mm [sup] 2 [/sup]
- 111.4 +/- 0.05 mm [sup] 2 [/sup]
- 111.4 +/- 0.25 mm [sup] 2 [/sup]

Check the answer of this question online at QuizOver.com:
Question: Pablo measures the diameter of a cylinder to Steve Gibbs Saylor Measurement

Flashcards:
http://www.quizover.com/flashcards/pablo-measures-the-diameter-of-a-cylinder-to-steve-gibbs-saylor-measur?pdf=1505

Interactive Question:
http://www.quizover.com/question/pablo-measures-the-diameter-of-a-cylinder-to-steve-gibbs-saylor-measur?pdf=1505

Author: Steve Gibbs

A small hydroelectric dam produces 90 megawatts of power. If a typical home in the area can consume 20kW at peak usage, how many such homes can the hydroelectric plant supply at peak usage?

Please choose only one answer:

- 5000
- 450
- 45,000
- 45
- 450,000

4.1.4. Calculate the mean and standard deviation of the following sample: ...

Author: Steve Gibbs

Calculate the mean and standard deviation of the following sample: 4.72, 4.83, 4.98, 5.07, 4.61, 2.05.

Please choose only one answer:

- 4.0, 1.0
- 1.33, 4.38
- 4.38, 1.33
- 4.37, 1.2
- 4.38, 1.15

Check the answer of this question online at QuizOver.com:
Question: Calculate the mean and standard deviation of Steve Gibbs Saylor Measurement

Flashcards:
http://www.quizover.com/flashcards/calculate-the-mean-and-standard-deviation-of-steve-gibbs-saylor-measur?pdf=1505

Interactive Question:
http://www.quizover.com/question/calculate-the-mean-and-standard-deviation-of-steve-gibbs-saylor-measur?pdf=1505

4.1.5. If there are 100,000,000,000 stars in a galaxy and 100,000,000,000 ...

Author: Steve Gibbs

If there are 100,000,000,000 stars in a galaxy and 100,000,000,000 galaxies in the universe, then how many stars are there in the universe?

Please choose only one answer:

- 10^{27}
- 10^{25}
- 10^{22}
- 10^{10}
- 10^{5}

Check the answer of this question online at QuizOver.com:
Question: If there are 100 000 000 000 stars in a galaxy Steve @The Saylor

Flashcards:
http://www.quizover.com/flashcards/if-there-are-100-000-000-000-stars-in-a-galaxy-steve-the-saylor?pdf=1505

Interactive Question:
http://www.quizover.com/question/if-there-are-100-000-000-000-stars-in-a-galaxy-steve-the-saylor?pdf=1505

4.1.6. Calculate (within a factor of 100) the number of water molecules in...

Author: Steve Gibbs

Calculate (within a factor of 100) the number of water molecules in a fully grown human being. The mass of one water molecule is approximately 3 x 10[sup]-23[/sup] g and a human being may be considered to be 70% water.

Please choose only one answer:

- $$10^{15}$$
- $$10^{20}$$
- $$10^{18}$$
- $$10^{27}$$
- $$10^{23}$$