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SPI PRACTICE questions exam 1

SPI PRACTICE questions exam 1 with correct answers 2024

- What best describes a sound wave? -answer- ✓A mechanical longitudinal wave
- What MUST be different on the two sides of an interface for refraction to occur? -answer- ✓Propagation speed of sound and oblique incidence
- The characteristic acoustic impedance of a medium equals the product of -answer- ✓density and speed of sound
- Ultrasonic attenuation is considered to consist of two parts scattering and absorption. Absorption is -answer- ✓local conversion of ultrasound energy to heat
- Which of the following has the greatest effect on the focal length of a single element transducer? -answer- ✓Doubling the element diameter
- Spatial pulse length is the product of the number of cycles in the pulse and the -answer- ✓wavelength
- Manipulating the output power control of an ultrasound instrument does NOT affect the -answer- ✓pulse repetition frequency
- What will be affected by the power? -answer- ✓echo amplitude
beam intensity
acoustic exposure to the patient
display dot brightness
- On pulse-echo equipment, the transducer actually transmits -answer- ✓under 1% of the time
- Ultrasonic intensity is measured in units of -answer- ✓energy per unit time per unit area (Watt)
- watt= -answer- ✓joules/second
- What fraction of ultrasonic energy is typically reflected at soft tissue interfaces? -answer- ✓1%
- If the reflected signal intensity from Object 1 is ten times greater than Object 2, what is the dB difference in reflected intensity between Object 1 and Object 2? -answer- ✓10 dB

SPI PRACTICE questions exam 1

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Reliable SPI Exam Preparation - Quiz ARDMS Realistic Sonography Principles and Instrumentation PDF Questions

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ARDMS Sonography Principles and Instrumentation Sample Questions (Q64-Q69):

NEW QUESTION # 64

What is the primary reason to use compression?

- A. Reduce the focal region
- B. Increase line density
- C. Adjust the contrast resolution
- D. Improve the axial resolution

Answer: C

Explanation:

- * Compression in ultrasound imaging adjusts the range of grayscale displayed, affecting the contrast resolution.
- * This function allows sonographers to enhance the differentiation between structures of varying echogenicities.
- * By modifying the contrast resolution, sonographers can better visualize subtle differences in tissue composition and improve the diagnostic quality of the images.
- * Increasing contrast resolution is particularly important in differentiating between fluid-filled cysts and solid masses. References:
- * ARDMS Sonography Principles and Instrumentation guidelines on image processing and contrast resolution.

NEW QUESTION # 65

Which spectral Doppler finding can occur when using a low pulse repetition frequency setting?

- A. Aliasing
- B. Range ambiguity
- C. Dropout
- D. Spectral broadening

Answer: A

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

Low PRF reduces the Nyquist limit, making the system more susceptible to aliasing when Doppler shift frequencies exceed this limit.

Principles and Instrumentation state:

"Aliasing occurs when Doppler shifts exceed half the PRF (Nyquist limit). Lowering PRF increases aliasing susceptibility."

* Spectral broadening (A) results from turbulence or poor angle.

* Range ambiguity (B) occurs at high PRF.

* Dropout (D) refers to signal loss, not aliasing.

Therefore, the correct answer is C: Aliasing.

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NEW QUESTION # 66

What would increase with an increase in acoustic power?

- A. Wavelength
- B. Thermal Index
- C. Impedance
- D. Frequency

Answer: B

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

The thermal index (TI) indicates the potential for tissue heating due to ultrasound energy absorption.

Increasing acoustic power increases the amount of energy transmitted into the body, which raises the thermal index.

According to sonography instrumentation reference:

"An increase in acoustic output power results in a corresponding increase in the thermal index, reflecting higher potential for tissue heating." Therefore, the correct answer is C: Thermal Index.

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NEW QUESTION # 67

Which color control was adjusted in color bar A to produce color bar B?

- A. Baseline
- B. Map
- C. Scale
- D. Invert

Answer: C

Explanation:

The color bar on a Doppler ultrasound display indicates the range of velocities that the system can detect and display. In color bar A, the scale is set to a higher maximum velocity (64 cm/s), while in color bar B, the scale is set to a lower maximum velocity (16 cm/s). Adjusting the scale (or velocity range) changes the upper and lower limits of the velocities displayed, which affects the sensitivity of the Doppler system to detect flow velocities. Lowering the scale allows for better visualization of lower velocities, but it may also increase the likelihood of aliasing for higher velocities.

Reference:

American Registry for Diagnostic Medical Sonography (ARDMS). Sonography Principles and Instrumentation (SPI) Examination Review Guide.

NEW QUESTION # 68

Which artifact is seen as a result of an increase in echo amplitude in the tissue located distal to an anechoic structure?

- A. Enhancement
- B. Comet tail
- C. Mirror image
- D. Reverberation

Answer: A

NEW QUESTION # 69

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