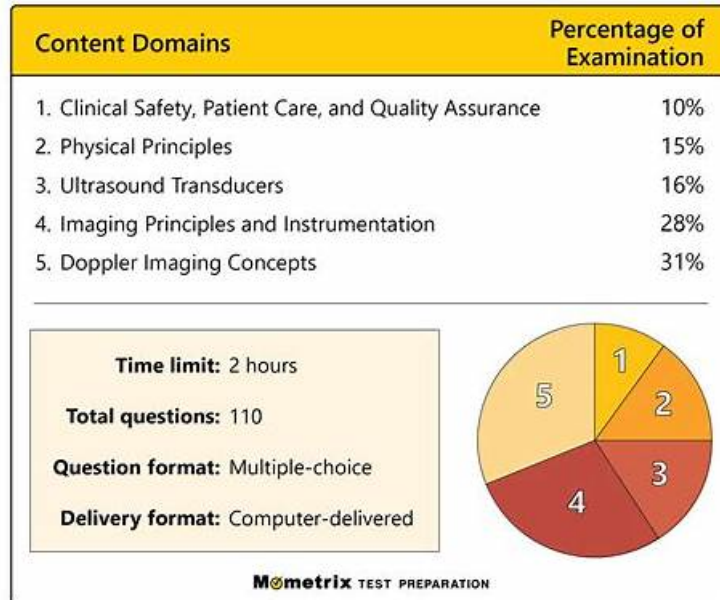


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ARDMS Sonography Principles and Instrumentation Sample Questions (Q201-Q206):

NEW QUESTION # 201

What happens to the amount of attenuation if the path length is doubled?

- A. Quadrupled
- B. Halved
- C. Quartered
- **D. Doubled**

Answer: D

Explanation:

Attenuation in ultrasound is directly proportional to the path length. If the path length is doubled, the amount of attenuation is also doubled. Attenuation refers to the reduction in the amplitude and intensity of the ultrasound wave as it travels through tissue, primarily due to absorption, reflection, and scattering. The relationship is linear, so doubling the distance the sound wave travels will result in twice the amount of attenuation.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines

Krenkau, F. W. (2015). Diagnostic Ultrasound: Principles and Instruments. Elsevier.

NEW QUESTION # 202

Which method of sanitizing the transducer would damage piezoelectric crystals?

- **A. Autoclave**
- B. Glutaraldehyde
- C. Alcohol
- D. Bleach

Answer: A

Explanation:

Autoclaving involves high-pressure steam at high temperatures, which can damage the delicate piezoelectric crystals within the ultrasound transducer. These crystals are responsible for converting electrical energy into sound waves and vice versa. Exposure to the extreme conditions of an autoclave can cause thermal and mechanical damage to the crystals, rendering the transducer ineffective.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines

Zagzebski, J. A. (1996). Essentials of Ultrasound Physics.

NEW QUESTION # 203

Which describes the reflected frequency when a reflector is moving toward the sound source?

- A. Unchanged
- **B. Increased**
- C. Decreased
- D. Attenuated

Answer: B

Explanation:

When a reflector (such as red blood cells) is moving toward the sound source, the frequency of the reflected sound waves increases. This phenomenon is known as the Doppler effect. The frequency shift occurs because the motion of the reflector compresses the sound waves, leading to a higher frequency than the emitted frequency. This increased frequency is what the Doppler ultrasound system detects and uses to calculate the velocity of the moving reflector.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines

Hoskins, P. R., Thrush, A., Martin, K., & Whittingham, T. A. (2010). Diagnostic Ultrasound: Physics and Equipment.

NEW QUESTION # 204

What is the primary determining factor of the fundamental frequency for pulsed wave transducers?

- A. Transducer type
- B. Crystal diameter
- C. Propagation speed
- **D. Element thickness**

Answer: D

Explanation:

The fundamental frequency of a pulsed wave transducer is primarily determined by the thickness of the piezoelectric element. The frequency is inversely proportional to the thickness of the element - thinner elements produce higher frequencies, while thicker elements produce lower frequencies. This relationship is derived from the formula $f = \frac{v}{2d}$, where f is the frequency, v is the propagation speed of sound in the piezoelectric material, and d is the thickness of the element.

References: ARDMS Sonography Principles and Instrumentation, Chapter on Transducer Technology.

NEW QUESTION # 205

Which factor affects lateral resolution in ultrasound?

- A. Wavelength
- B. Propagation speed
- **C. Beam width**
- D. Depth of penetration

Answer: C

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

Lateral resolution is the system's ability to distinguish two structures side-by-side. It is directly determined by the beam width - the narrower the beam, the better the lateral resolution.

Principles and Instrumentation:

"Lateral resolution depends on beam width at a given depth. Narrower beams provide better lateral resolution."

* Depth of penetration influences maximum imaging depth.

* Propagation speed is largely constant in soft tissue.

* Wavelength affects axial resolution.

Therefore, the correct answer is A: Beam width.

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NEW QUESTION # 206

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