



SONOGRAPH/ULTRASOUND TECHNICIAN TEST

NAME: _____

DATE: _____

1. **Attenuation increases as frequency _____.**
 - a. Increases
 - b. Decreases

2. ***Aliasing* is a potential problem in PW Doppler because of:**
 - a. The motion of the interface perpendicular to ultrasound wave propagation
 - b. The use of high pulse repetition frequencies
 - c. The Doppler sample is sampled rather than recorded continuously
 - d. Dynamic focusing

3. **By definition, ultrasound is sound having a frequency greater than _____ cycles per second, that is, sound above the audible range.**
 - a. 10,000
 - b. 20,000
 - c. 30,000
 - d. 40,000

4. **Which of the following is not a property of acoustic waves?**
 - a. Particles in the medium oscillate with equal excursion in the positive and negative directions.
 - b. Pressure and particle velocity are in-phase.
 - c. There is movement of the material.
 - d. The wave front is attenuated by converting the energy in the pressure wave to heat.

5. **Describe the basics of scattering.**
 - a. Acoustic scattering results from objects on the order of a wavelength in size (representing a rough surface)
 - b. Some organs have a characteristic surface structure that gives rise to a characteristic scatter signature (useful diagnostically)
 - c. "Rough" reflectors reflect sound over a range of angles, thus causing loss in amplitude of received echoes.
 - d. All of the above

6. **What Doppler technique does NOT provide range resolution?**
- Power Doppler
 - Pulsed-wave Doppler
 - Color Doppler
 - Continuous-wave Doppler
7. **1 atmosphere (14.7 psi) =**
- 10kPa
 - 50kPa
 - 75kPA
 - 100kPa
8. **Which of the following types of tissue would have the lowest mean propagation velocity.**
- Air
 - Fat
 - Water
 - Blood
9. **The ___ transducer and corresponding field of excitation excites molecules in the traditional “pie-shaped” field.**
- 1D
 - 2D
 - 3D
 - 4D
10. **An *echogenic image* is one that**
- Is produced by an object that transmits most ultrasound waves. It will appear white on the ultrasound screen.
 - Is produced by an object that reflects most ultrasound waves. It will appear white on the ultrasound screen.
 - Is produced by an object that transmits most ultrasound waves. It appears dark or black on the ultrasound screen.
 - Is produced by an object that transmits and reflects ultrasound waves. It will appear gray on the ultrasound screen.
11. **Which of the following is not a factor determining spatial resolution?**
- Pulse interval
 - Frequency (wavelength)
 - Transmit intensity
 - Acquisition
12. **The packet size in color Doppler refers to the number of**
- Scan lines per unit area
 - Pulses per second
 - Pulse-listen cycles per acoustic scan line
 - Pulses required to create one frame

13. What is the mean propagation velocity for human tissue?

- a. $330 \text{ m}\cdot\text{s}^{-1}$
- b. $1540 \text{ m}\cdot\text{s}^{-1}$
- c. $2440 \text{ m}\cdot\text{s}^{-1}$
- d. $4080 \text{ m}\cdot\text{s}^{-1}$

14. An *anechoic image* is one that

- a. Is produced by an object that transmits and reflects ultrasound waves. It will appear gray on the ultrasound screen.
- b. Is produced by an object that transmits most ultrasound waves. It will appear white on the ultrasound screen.
- c. Is produced by an object that reflects most ultrasound waves. It will appear white on the ultrasound screen.
- d. Is produced by an object that transmits most ultrasound waves. It appears dark or black on the ultrasound screen.

15. A commonly used process for determining direction in a Doppler instrument is:

- a. Zero-crossing detection
- b. Autocorrelation
- c. Phase quadrature detection
- d. Spectral analysis