Test Bank - Chapter 01

Q1: Diagnostic ultrasound transducers generate a _____ of sound into the body.

A. wave
B. pulse (Correct)
C. frequency
D. Doppler

Rationale: Diagnostic ultrasound transducers generate the ultrasound pulses and receive the returning pulses.

Q2: The brightness of the dot corresponds to the _____ of the returning echo.

A. location
B. speed
C. strength (Correct)
D. angle

Rationale: The brightness of the dot corresponds to the echo strength, producing what then is known as a gray-scale image.

Q3: A rectangular image display is seen when using a _____ transducer.

A. sector
B. vector
C. convex
D. linear (Correct)

Rationale: Pulses (scan lines) travel from different points parallel with each other, displaying a rectangular image.

Q4: The location of each dot corresponds to the _____ of the echo to return.

A. strength
B. time (Correct)
C. pulse
D. frequency

Rationale: The location of each dot corresponds to the anatomic location of the echo-generating structure.

Q5: The method by which each pulse originates from the same starting point is called a _____ image.

A. sector (Correct)
B. linear

C. convex
D. none are correct

Rationale: A sector image results when each pulse originates from the same starting point and subsequent pulses going out in different directions.

Q6: Sonographic images are composed of many _____.

A. crystals
B. scan lines (Correct)
C. focal points
D. frequency shifts

Rationale: Sonographic images are composed of many scan lines (pulses).

Q7: Echoes produced by _____ objects have different _____ than the pulses sent into the body.

A. stationary; frequencies
B. stable; directions
C. moving; frequencies (Correct)
D. moving; echoes

Rationale: Echoes produced by moving objects have different frequencies than the pulses sent into the body.

Q8: Doppler ultrasound measures the movement of _____.

A. tissue
B. blood
C. both a and b (Correct)
D. none are correct

Rationale: Doppler ultrasound is used in detecting and measuring tissue motion and blood flow.

Q9: Quantitative data are determined by which Doppler display?

A. Color imaging
B. Power imaging
C. B-mode (gray-scale, or brightness) imaging
D. Spectral imaging (Correct)

Rationale: Doppler information is applied to loudspeakers for audible evaluation and to the spectral display for quantitative analysis.

Q10: Aspects of Operating Principle 2 include all of the following except _____:

A. retrospective computational beam-forming determines the echo information.

B. image quality is improved over Operating Principle 1.

C. pulses of ultrasound are not sent in a one-to-one correspondence of pulse and displayed scan line.

D. has been the underlying Operating Principle throughout the history of sonography. (Correct)

Rationale: Operating Principle 2 is used in recent, sophisticated instruments. Operating Principle 1 has been the underlying Operating Principle for all systems throughout the 50-year history of sonography. The changing technology, with various characteristics and features, has necessitated a second Operating Principle to highlight the differences.

Q11: The Doppler effect is a change in echo _____.

A. frequency (Correct)

B. strength

C. amplitude

D. direction

Rationale: The Doppler effect is a change in frequency caused by moving objects.

Q12: Vertical parallel scan lines are seen with which transducer format?

A. Vector

B. Convex

C. Linear (Correct)

D. Curvilinear

Rationale: A linear transducer generates vertical parallel scan lines.

Q13: A gray-scale ultrasound image is the visible counterpart of a/an _____.

A. frequency shift

B. spectral display

C. invisible object (Correct)

D. electronic wave

Rationale: An ultrasound image is the visible counterpart of an invisible object, produced in an electronic instrument by the interaction of ultrasound with the object.

Q14: A _____ scan is shaped like a slice of pie.

A. sector (Correct)

B. convex

C. linear

D. curvilinear

Rationale: A sector image is shaped like a slice of pie.

Q15: Sonography is medical anatomic imaging using a _____ technique.

A. starting point
B. pulse-echo (Correct)
C. vertical parallel
D. transducer instrument

Rationale: Anatomic imaging with ultrasound is accomplished by the pulse-echo principle.

Q16: Three-dimensional imaging requires many adjacent tissue _____ to build the image.

A. moving objects
B. frequency shifts
C. cross sections (Correct)
D. ultrasound pulses

Rationale: Three-dimensional, or volume, imaging requires scanning the ultrasound through many adjacent two-dimensional tissue cross sections to build up a three-dimensional volume of echo information.

Q17: In Operating Principle 2, _____ determine the location and strength of each echo produced at each location in the anatomy.

A. harmonics imaging
B. frequency shifts
C. massive computational processes (Correct)
D. one-to-one pulse-echo correspondence

Rationale: In Operating Principle 2, massive computational processes determine the location and strength of each echo produced at each location in the anatomy. This retrospective computational beam-forming process is different from Operating Principle 1, which relies on a one-for-one correspondence of pulse and displayed scan line.

Q18: In Operating Principle 1, one pulse of ultrasound generates a single scan line as it travels through tissue.

A. True (Correct)
B. False

Rationale: In Operating Principle 1, one line of echo information (pulse) is equal to one scan line.

Q19: Pulsed ultrasound transducers can generate only ultrasound pulses.

A. True (Correct)
B. False

Rationale: The transducer generates the ultrasound pulses and receives the returning echoes.

Q20: The Doppler effect is caused by a difference in the depth of two moving objects.

A. True (Correct)
B. False

Rationale: The Doppler effect is a change in frequency caused by moving objects.

Q21: Operating Principle 2 produces improved image quality compared to Principle 1.

A. True (Correct)
B. False

Rationale: Operating Principle 2 is used in recent sophisticated instruments and produces improved image quality compared to Operating Principle 1.

Q22: Animals have applied ultrasound to detect and capture prey.

A. True (Correct)
B. False

Rationale: Bats, dolphins, and other animals use ultrasound to detect, locate, determine motion of, and capture prey; to avoid obstacles; to detect and avoid predators; and to court mates.

Q23: Color Doppler imaging is superimposed on a gray-scale image.

A. True (Correct)
B. False

Rationale: Rapid scanning and processing of the Doppler data enable color-coded presentation of Doppler information to be superimposed on a gray-scale anatomic image.

Q24: Retrospective computational beam-forming used in Operating Principle 1 determines the echo information at each location in the scan.

A. True
B. False (Correct)

Rationale: With Operating Principle 2, the retrospective computational beam-forming determines the echo information at each location in the scan.