

CBIP Examination Paper - UT Thickness Testing
Level 1 General

- 1 Ultrasonic transducers produce which sound waves in the probe shoe?
A. Surface waves
B. Longitudinal waves
C. Transverse waves
D. All of the above
- 3 Which of the following modes of vibration has the lowest velocity in a given material?
A. Longitudinal wave
B. Shear wave
C. Surface wave
D. Compression wave
- 5 Ultrasonic wave velocity in a given material is
A. Constant for a given wave mode
B. Equal to frequency x wavelength
C. Different for different wave modes
D. All of the above
- 7 Rayleigh waves are influenced most by defects located:
A. One wavelength below the surface
B. Six wavelengths below the surface
C. Close to or on the surface
D. Three wavelengths below the surface
- 9 Sound wave velocity is not dependent on
A. The material under test
B. The mode of vibration
C. The transducer frequency
D. None of the above
- 11 Calculate the velocity of a wave with a frequency of 3.0 MHz and a wavelength of 1.2mm
A. 2500 m/s
B. 3230 m/s
C. 3600 m/s
D. 5920 m/s

- 13 Acoustic velocities are determined by:
A. Density
B. Elasticity
C. Wave mode
D. All of the above
- 15 The frequency of a transducer is primarily a function of:
A. The amplifier characteristics
B. The thickness of the crystal
C. The pulse repetition frequency
D. All of the above
- 17 The angle of refraction is:
A. Determined by Snell's Law
B. Dependent on material velocities
C. Different for different wave modes
D. All of the above
- 19 Which of the following material characteristics may affect the acoustic attenuation in the material:
A. Grain size
B. Couplant
C. Acoustic impedance
D. All of the above
- 21 The shape of an ultrasonic beam located in the far zone can be considered as:
A. Cylindrical
B. Spherical
C. Pyramidal
D. None of the above
- 23 In the formula $\sin \theta_1 / V_1 = \sin \theta_2 / V_2$, V is used to represent:
A. Angles
B. Velocities
C. Amount of reflected sound energy
D. Acoustic impedances
- 25 Which of the following are true about beam divergence:
A. It is affected by wavelength
B. It is affected by acoustic impedance
C. It is affected by the coupling
D. All of the above

- 27 The ability to resolve two discontinuities at different depths would be improved by:
- A. Decreasing the frequency
 - B. Shortening the pulse duration
 - C. Increasing the amplitude of the initial pulse
 - D. None of the above
- 29 The length of the near zone is dependent upon which of the following?
- A. The diameter of the transducer
 - B. The frequency of the transducer
 - C. Both A and B
 - D. Neither A nor B
- 31 A test method in which the ultrasonic sound is emitted by a transmitting search unit, transmitted through the test part and picked up by a second receiving search unit on the opposite boundary is called:
- A. Surface wave testing
 - B. Angle beam testing
 - C. Through-transmission testing
 - D. All of the above
- 33 In immersion testing, focusing of the sound beam is accomplished with:
- A. An acoustic lens
 - B. Two separate probes
 - C. A shorter than usual stand-off
 - D. A higher frequency probe
- 35 The process of adjusting the settings of an instrument to a reference standard is referred to as :
- A. Zeroing
 - B. Metrology
 - C. Distance-amplitude correction
 - D. Calibration.
- 37 A level 1 NDT technician may:
- A. Select the test technique
 - B. Record defects detected
 - C. Interpret code requirements
 - D. None of the above
- 39 In ultrasonic testing, a liquid coupling medium between the crystal surface and the part surface is necessary:
- A. To minimise wear on the probe surface
 - B. Because an air interface would almost completely reflect the acoustic energy
 - C. Because the crystal will not vibrate if in contact with the part surface
 - D. To complete the electrical circuit between the part and the crystal