

Model Questions For UT Level – II

1. The velocity of longitudinal waves will be highest in:
 - a. Water
 - b. Air
 - c. Aluminum
 - d. Plastic
2. Angle of beam divergence will change if,
 - a. Frequency and size of the probe are changed
 - b. Type and length of the cable are changed
 - c. Gain and pulsar voltage of the flaw are changed
 - d. All of the above
3. The velocity of Rayleigh waves in a material depends on
 - a. The frequency of the waves
 - b. The wavelength of the waves
 - c. The elastic properties of the material
 - d. The method of generation of the Rayleigh waves.
4. Lamb waves can be used for testing
 - a. An aluminum plate 50 mm thick
 - b. A low alloy steel pipe with 50 mm OD and 47 ID
 - c. A stainless steel casting 300 mm thick
 - d. All of the above
5. When normal beam testing from the end face of a longer bar of square cross section was carried out, small echoes were obtained immediately after the first back echo. These echoes are most probably due to
 - a. Poor coupling
 - b. Resonance
 - c. High frequency
 - d. Side wall reflections
6. Resolution of two defects lying close each other thickness direction depends on
 - a. The range for which the flaw detector is calibrated
 - b. The flaw detector alone
 - c. The probe alone
 - d. The combination of flaw detector and probe
7. A copper bar and a brass bar have same grain size. When inspected by 2 MHz longitudinal waves the two bars will have in general
 - a. Same attenuation coefficient
 - b. Different attenuation coefficients
 - c. Same attenuation coefficients if their diameters are same
 - d. Same of different attenuation coefficient depending on the probe diameter
8. When calibration was re-checked during inspection, it was found that the gain had decreased by 10 dB. In this case which of the following is true?
 - a. The recorded data are not valid, and reinspection should be done
 - b. The recorded data are valid in case highly damped probe was used
 - c. The recorded data are valid provided that the echo heights are recalculated

- d. The recorded data are valid provided the defect metal paths are recalculated
 - e. Only the recorded indications are to be rechecked and reevaluated
9. A 90 mm thick mild steel plate is overlaid with 10 mm stainless steel. To detect lack of bond, inspection is done from the carbon steel side. The most suitable metal path range for this case will be,
- a. 0-150 mm
 - b. 0-100 mm
 - c. 85-095 mm
 - d. 90-100 mm
10. ASTM distance amplitude set of blocks is primarily meant for obtaining,
- a. DAC curve
 - b. Area amplitude curve
 - c. Resolving power
 - d. Vertical linearity
11. The smallest range (steel) for which the flaw detector can be calibrated for angle beam using V-2 block is
- a. 25 mm
 - b. 50 mm
 - c. 75 mm
 - d. 100 mm
12. For setting metal path range for angle beam using V-1 or V-2 blocks, one should have previous knowledge of
- a. The probe index point
 - b. The beam angle
 - c. Both a and b
 - d. Neither a nor b
13. Which of the following is /are service induced defects
- a. Lamination
 - b. Fatigue cracks
 - c. Corrosion cracks
 - d. None of the above
 - e. Both b and c
14. Which of the following displays gives a top view of plan view of the defect
- a. A scan
 - b. B scan
 - c. C scan
 - d. D scan
15. The size of the flaw determined by using DCS diagram is
- a. The exact size of the flaw
 - b. The size of the flat disc shaped defect at the same depth as the flaw which would give same height of echo as the natural flaw
 - c. The size of cylindrical shaped defects situated at the same depth as the flaw which would give same height of echo as the natural flaw.
 - d. None of the above.
16. For accurate sizing of a flaw based on comparison of heights, the instrument should have

- a. Good sweep linearity
 - b. Good amplifier linearity
 - c. Good resolution
 - d. Good penetration power
17. To detect root cracks in a single V butt weld which of the following is most suitable?
- a. a high frequency normal beam probe
 - b. a highly damped probe
 - c. a 45° angle beam probe
 - d. a 60° angle beam probe
18. Which of the following modes of vibration are quickly damped out when testing by the immersion method?
- a. Longitudinal wave
 - b. Shear waves
 - c. Transfers waves
 - d. Surface waves
19. During normal beam inspection, a severe reduction of back echo without any defect indication was obtained. This may be due to.
- a. Large defect parallel to the scanning surface
 - b. A large defect inclined at a large angle to the scanning surface.
 - c. A small cavity
 - d. All of the above.
20. In contact testing, defects near the entry surface cannot always be detected because of,
- a. The far-field effect
 - b. Attenuation
 - c. The dead zone
 - d. Refraction
21. Which of the following will give best resolution?
- a. Highly damped probe
 - b. Low frequency probe
 - c. Large angle probe
 - d. Probe with hard protective coating
22. Where does beam divergence occur?
- a. Near field
 - b. Far field
 - c. At the crystal
 - d. None of the above
23. As transducer diameter decreases, the beam spread
- a. Decreased
 - b. Remains the same
 - c. Increases
 - d. Becomes conical in shape
24. In order to find the smallest discontinuity during UT, one should use
- a. The lowest frequency possible
 - b. The highest frequency possible
 - c. The smallest probe possible

- d. The probe with smallest near zone
 - e. Through transmission technique
25. To detect lamination type of defects at the mid section of 175mm thick steel slabs, the best probe will be
- a. a 2 MHz normal probe
 - b. a 2 MHz double crystal probe
 - c. a highly damped probe
 - d. a 45° angle beam probe
26. In a basic pulse echo ultrasonic instrument, the component that produces the time base line is called a:
- a. Sweep circuit
 - b. Receiver
 - c. Pulsar
 - d. synchronizer
27. A set of standard reference blocks with the same geometrical configuration and dimensions other than the size of the calibration reflectors. e.g. flat bottom holes, is called a set of:
- a. DAC blocks
 - b. Area amplitude blocks
 - c. Variable Frequency blocks
 - d. Beam spread measuring blocks
28. In an ultrasonic instrument, the number of pulses produced by an instrument in a given time is know an:
- a. Pulse length of the instruments
 - b. Pulse recovery time
 - c. Frequency
 - d. Pulse repetition rate
29. On an A-scan display, what represents the intensity of a reflected beam?
- a. Echo pulse width
 - b. Horizontal screen location
 - c. Signal brightness
 - d. Signal amplitude
30. Lamb waves can be used to detect
- a. Laminar type defects near the surface of a thin material
 - b. Lack of fusion in the center of a thick weldment
 - c. Internal voids in diffusion bonds
 - d. Thickness changes in heavy plate material
31. Normal beam testing of single V butt welds will detect
- a. Slag inclusions
 - b. Lack of side wall fusion
 - c. Under cut
 - d. All of the above
32. Inspection of casings is often impractical because of :
- a. Extremely small grains
 - b. Coarse grain structure
 - c. Uniform flow lines

- d. Uniform velocity
33. Longitudinal waves are rarely used for angle beam ultrasonic inspection because
- a. Longitudinal waves cannot travel in solids
 - b. Longitudinal waves are refracted at lower angles than shear waves in the same medium
 - c. Longitudinal waves are almost always accompanied by shear waves due to refraction and mode conversion
 - d. It is not possible to propagate longitudinal waves at an angle
34. An important advantage of twin probe over single element probe is,
- a. Reduced dead zone
 - b. Better resolution
 - c. Faster inspection
 - d. None of the above
35. Dead zone is defined as
- a. The distance in front of the probe in which fluctuation in ultrasonic intensity can occur.
 - b. The zone of material not inspected by the ultrasonic beam
 - c. The distance covered by the front surface pulse on an A-scan display plus the amplifier recovery time
 - d. The region between the near field and far field
36. Which ultrasonic test frequency would probably provide the best penetration in a 30cm thick specimen of coarse grained steel?
- a. 1 MHz
 - b. 2.25MHz
 - c. 5MHz
 - d. 10MHz
37. Skip distance for a particular job depends on
- a. The ultrasonic beam angle
 - b. The test frequency
 - c. The thickness of the test object
 - d. Both a and b
 - e. Both a and c
38. Ultrasonic waves cannot pass through air because air has,
- a. Low acoustic impedance
 - b. Low physical density
 - c. Low velocity for ultrasound
 - d. None of the above statements is true, ultrasound can pass through air.
39. If the acoustic impedance of a material is high
- a. Ultrasonic waves will be highly attenuated in the material
 - b. Ultrasonic waves will travel slower in the material
 - c. Both a and b
 - d. Neither a nor b
40. When ultrasonic waves travel from steel into aluminum
- a. Its velocity changes, but frequency remains same
 - b. Its frequency changes, but velocity remains same
 - c. Both velocity and frequency will change
 - d. Either velocity or frequency will change depending upon the angle of incidence

Ans:

1. C
2. D
3. A
4. D
5. C
6. D
7. B
8. C
9. C
10. A
11. D
12. B
13. E
14. C
15. B
16. B
17. C
18. d
19. B
20. c
21. A
22. B
23. C
24. B
25. B
26. A
27. B
28. D
29. D
30. A
31. A
32. B
33. C
34. A
35. B
36. A
37. E
38. D
39. A
40. A

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