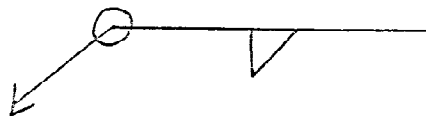


WLDG 2311
TEST #1
SIMULATED CWI TEST
FUNDAMENTALS

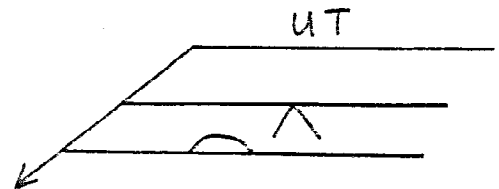
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Directions: Choose the best answer for the following questions and mark your answer on the scantron. Do not write on this portion of the test.

1. What is the basic element of evaluation in any quality control program?
 - a. radiographic testing
 - b. penetrant testing
 - c. visual inspection
 - d. all of the above
 - e. none of the above
2. Which of the following methods can be employed to reduce or eliminate distortion?
 - a. backstep technique
 - b. prebending plates to be welded
 - c. presetting members to be welded
 - d. use of peening
 - e. all of the above
3. When should the applicable job documents be reviewed?
 - a. after the job is complete
 - b. before welding begins
 - c. at any time when information is necessary
 - d. a and b above
 - e. b and c above
4. Stress risers in a weld are caused by:
 - a. low impact strength of the weld metal
 - b. low yield strength of the heat affected zone
 - c. undercuts, incomplete penetration
 - d. a smooth butt joint
 - e. all of the above
5. Referring to the welding symbol below, the length of the weld:
 - a. is not important
 - b. can be determined from the drawing
 - c. cannot be determined
 - d. all of the above
 - e. none of the above
6. SMAW can be utilized in which type of application?
 - a. semi automatic
 - b. machine
 - c. manual
 - d. all of the above
 - e. none of the above

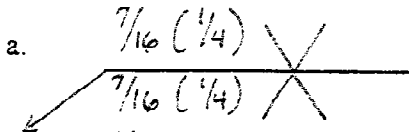
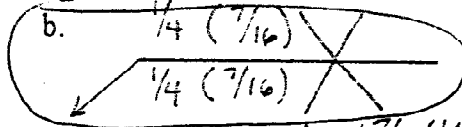

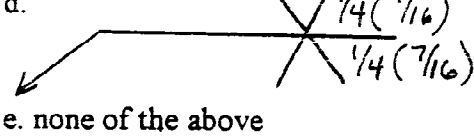


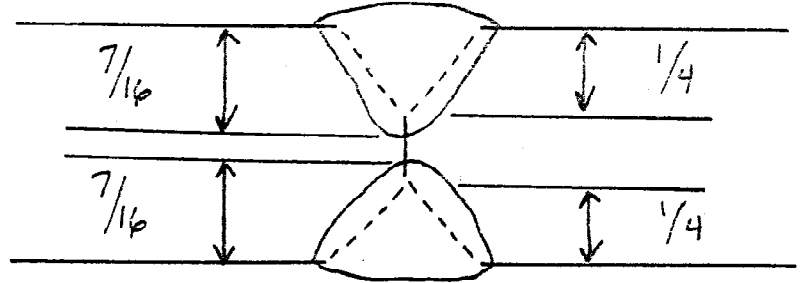
7. Underbead cracking is primarily caused by:
- a source of hydrogen
 - restraint
 - excessive preheat
 - all of the above
 - none of the above
8. Which is not a true statement about brazing?
- the base metal is not melted
 - the filler metal melts at a temperature below 840 degrees
 - it can be done in an inert gas atmosphere
 - it relies on capillary action
 - none of the above
9. Which welding process utilizes a constant current power source?
- GMAW
 - SMAW
 - GTAW
 - a and b above
 - b and c above
10. Which of the following discontinuities is associated with shrinkage stresses in the through-thickness direction of thick plate?
- crater cracks
 - lamellar tears
 - toe cracks
 - root cracks
 - none of the above
11. Which of the welding techniques below describes a welding process in which the arc and filler metal feeding is machine operated while the joint travel speed and guidance are the responsibility of the welder?
- semi-automatic
 - manual
 - machine
 - automatic
 - none of the above
12. Referring to the welding symbol below, ultrasonic inspection is to be performed:
- on the backing weld only
 - on the entire length of weld
 - on 10% of the weld length
 - from the arrow side only
 - none of the above



13. For the 2G position in pipe welding:
- the axis of the pipe is vertical and the plane of the weld is horizontal
 - the axis of the pipe is horizontal and the plane of the weld is vertical
 - the pipe is not fixed
 - the axis of the pipe and the plane of the weld are at 45 degree angles with the vertical plane

14. Which of the following symbols correctly describes the joint configuration shown below?

- a. 
- b. 
- c. 
- d. 
- e. none of the above



15. The welding symbol below depicts:

- a. backing weld
- b. field weld
- c. melt thru weld
- d. weld all around
- e. grind to a rounded contour



16. The weld discontinuity that results from improper termination of the welding arc is referred to as:

- a. undercut
- b. overlap
- c. crater crack
- d. incomplete fusion
- e. all of the above

17. Which of the following is not a function of the flux coating on an SMAW electrode?

- a. alloying
- b. deoxidation
- c. shielding
- d. all of the above
- e. none of the above

18. All of the following contain job quality requirements except:

- a. codes
- b. drawings
- c. specifications
- d. textbooks
- e. standards

19. The job documents that best describe the size and configuration of a weldment are:
- a. codes
 - b. specifications
 - c. standards
 - d. drawings
 - e. none of the above
20. The type of document that has legal status is:
- a. code
 - b. standard
 - c. specification
 - d. a and b above
 - e. all of the above
21. The type of document that describes the requirements for a particular material or component is referred to as:
- a. code
 - b. standard
 - c. specification
 - d. a and b above
 - e. b and c above
22. Which of the following is not considered a type of joint?
- a. butt
 - b. tee
 - c. fillet
 - d. corner
 - e. edge
23. The property of metals that describes their ability to carry some type of load is:
- a. strength
 - b. toughness
 - c. hardness
 - d. ductility
 - e. none of the above
24. In a single V-groove weld, the sloped surfaces against which the weld metal is applied are called:
- a. root face
 - b. root
 - c. groove face
 - d. groove angle
 - e. bevel angle
25. In the AWS classification for SMAW electrodes, the last digit refers to:
- a. position capability
 - b. tensile strength
 - c. type of coating and current requirement
 - d. ease of slag removal
 - e. none of the above

26. In the AWS classification for SAW electrode, flux combination F7A2-EM12K, the "M" stands for:

- a. an electrode with a medium carbon content
- b. metallic arc
- c. an electrode with a medium alloy content
- d. an electrode with a medium manganese content
- e. none of the above

27. Which of the following is an incorrect statement about an SMAW electrode designated as an E7014?

- a. it is a low hydrogen type
- b. the weld deposit has a minimum tensile strength of 70,000 psi.
- c. it is suitable for welding in all positions
- d. all of the above
- e. none of the above

28. When rapid cooling produces a martensitic structure, what nonaustenitizing heat treatment may be applied to improve the ductility of the steel?

- a. quenching
- b. tempering
- c. annealing
- d. normalizing
- e. none of the above

29. The type of alloying in which the alloy atoms replace some of the atoms in the parent metals lattice structure is referred to as:

- a. atomic alloying
- b. substitutional alloying
- c. space alloying
- d. interstitial alloying
- e. none of the above

30. Which of the following is an expression for a metals ductility?

- a. percent elongation
- b. percent reduction in area
- c. proportional limit
- d. a and b above
- e. b and c above

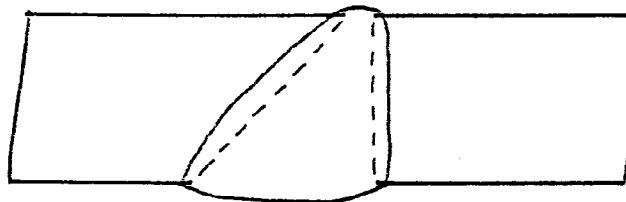
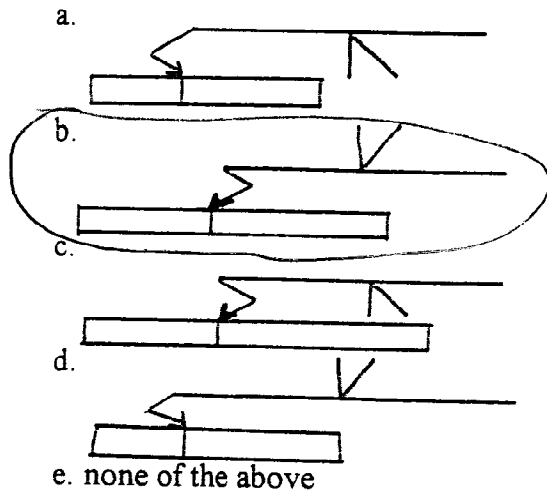
31. Which of the following can be determined from a tensile test?

- a. yield strength
- b. ultimate tensile strength
- c. percent elongation
- d. a and b above
- e. all of the above

32. A number in parenthesis just above or below a test symbol describes:

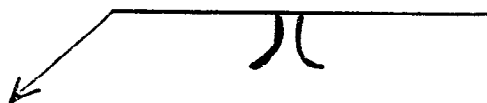
- a. the length of weld to be tested
- b. the extent of testing
- c. the number of tests to perform
- d. the type of test to perform
- e. none of the above

33. Which of the welding symbols describe the weld shown below?



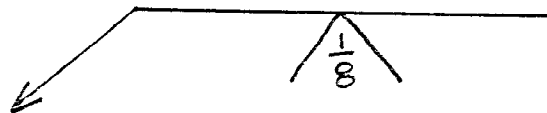
34. The welding symbol below depicts what type of weld?

- a. flare bevel groove weld
- b. flare vee groove weld
- c. edge flange
- d. corner flange
- e. none of the above



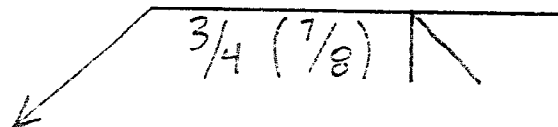
35. In the symbol below, the 1/8 dimension refers to what?

- a. groove angle
- b. root face
- c. depth of preparation
- d. weld size
- e. root opening



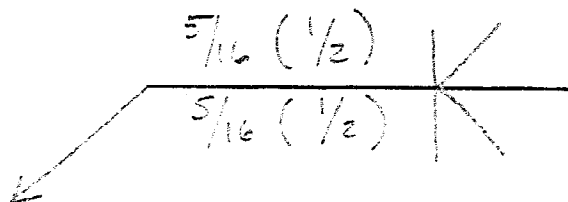
36. In the symbol below, the 3/4 dimension refers to what?

- a. weld size
- b. effective throat
- c. depth of preparation
- d. root opening
- e. none of the above



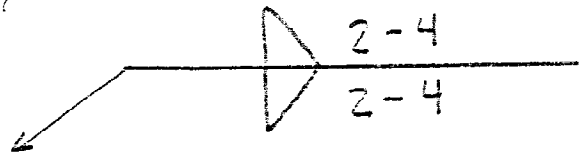
37. If applied to a 1 inch thick weld joint, the symbol below describes what type of weld?

- a. full penetration double bevel groove weld
- b. full penetration double vee groove weld
- c. partial penetration double bevel groove weld
- d. partial penetration double vee groove weld



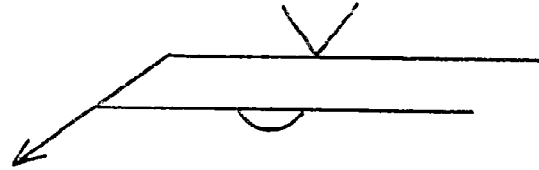
38. The symbol below describes what type of weld?

- a. staggered intermittent fillet weld
- b. chain intermittent fillet weld
- c. segmented fillet weld
- d. all of the above
- e. none of the above



39. The symbol below shows what type of weld?

- a. single bevel groove weld
- b. backing weld
- c. single vee groove weld
- d. back weld
- e. b and c above



40. When using a welding electrode whose strength matches the base metal strength, what region of the weld zone generally exhibits the highest hardness?

- a. base metal
- b. heat affected zone next to the base metal
- c. heat affected zone next to the weld metal
- d. weld metal
- e. cannot be determined

41. What heat treatment is characterized by holding the part at the austenitizing temperature for some time and then slow cooling in the furnace?

- a. normalizing
- b. austempering
- c. annealing
- d. stress relief
- e. quenching

42. Which of the following welding problems is the result of a distorted magnetic field that deflects the welding arc?

- a. cracks
- b. short circuiting
- c. insufficient fusion
- d. arc blow
- e. all of the above

43. All of the following are essential parts of a typical SMAW system except:

- a. constant current power supply
- b. wire feeder
- c. covered electrode
- d. electrode lead
- e. ground lead

44. Which of the following will increase the heat input on welds being performed on aluminum with GTAW using argon shielding gas?
- decrease the amperage
 - increase the travel speed
 - increase the machines open circuit voltage
 - switch to an argon/helium gas mixture
 - none of the above
45. GTAW can be performed with all but which of the following gases?
- carbon dioxide
 - argon
 - helium
 - argon/helium
 - none of the above
46. A red stripe on a tungsten electrode designates:
- 1% thoriated tungsten
 - 2% thoriated tungsten
 - pure tungsten
 - zirconiated tungsten
 - ceriated tungsten
47. Which of the following processes is typically used in the flat position unless special apparatus is employed?
- GMAW
 - SAW
 - FCAW
 - SMAW
 - GTAW
48. All of the following gases can be used to perform OFC except:
- methylacetylene-propadiene
 - propane
 - acetylene
 - natural gas
 - none of the above
49. Which of the following cutting processes can be used to cut any metal that conducts electricity?
- OFC
 - AAC
 - PAC
 - a and b above
 - b and c above
50. The width of a cut is technically referred to as the:
- gap
 - dross
 - kerf
 - drag
 - none of the above

51. In the AWS classification for flux cored electrodes, the second digit refers to what?
- a. tensile strength
 - b. position capability
 - c. tubular electrode
 - d. current requirements
 - e. none of the above
52. Which of the following processes utilizes a constant potential power source?
- a. GTAW
 - b. SMAW
 - c. FCAW
 - d. GMAW
 - e. c and d above
53. All of the following are commonly used as shielding gases for GMAW except:
- a. carbon dioxide
 - b. argon-oxygen
 - c. argon-carbon dioxide
 - d. argon
 - e. none of the above
54. Which of the following types of metal transfer in GMAW is considered to be the lowest energy and therefore prone to incomplete fusion?
- a. short circuiting
 - b. spray
 - c. pulsed arc
 - d. globular
 - e. none of the above
55. Which of the following welding processes is capable of making full penetration square groove welds on 6" thick plate in a single pass?
- a. SMAW
 - b. EBW
 - c. GTAW
 - d. GMAW
 - e. OFW
56. Which of the following is not considered an arc welding process?
- a. SMAW
 - b. GMAW
 - c. FCAW
 - d. ESW
 - e. none of the above
57. What aspect of the GTAW and PAW process is different than for the other arc welding processes?
- a. non consumable electrode
 - b. power supply
 - c. shielding
 - d. all of the above
 - e. none of the above

58. SAW and ESW are similar in that:
- both are arc welding processes
 - both use shielding gases
 - both use a granular flux
 - a and b above
 - a and c above
59. The type of weld configuration formed when a round bar is placed against a flat surface is called:
- flare bevel
 - flare vee
 - edge flange
 - corner flange
 - none of the above
60. Which type of weld having a generally triangular cross section is applied to either a T, corner, or lap joint?
- groove weld
 - fillet weld
 - flange weld
 - slot weld
 - plug weld
61. The type of weld applied to the opposite side of a joint before a single vee groove weld is completed on the near side of a joint is called:
- melt thru weld
 - backing weld
 - back weld
 - root weld
 - none of the above
62. In a completed groove weld, the surface of the weld on the side where the welding was done is called the:
- crown
 - weld reinforcement
 - weld face
 - root
 - none of the above
63. In a completed weld, the junction between the weld face and the base metal is called the:
- root
 - weld edge
 - weld reinforcement
 - leg
 - toe
64. In a fillet weld, the leg and size are the same for what type of configuration?
- effective throat
 - concave
 - convex
 - unequal leg

65. When looking at the cross section of a completed groove weld, the difference between the fusion face and the weld interface is called the:
- a. depth of fusion
 - b. depth of penetration
 - c. root penetration
 - d. joint penetration
 - e. effective throat
66. For a concave fillet weld, which dimensions are the same?
- a. theoretical and effective
 - b. effective and actual
 - c. theoretical and actual
 - d. all of the above
 - e. none of the above
67. In a partial penetration groove weld, the dimension measured from the joint root to where the weld penetration stops is:
- a. joint penetration
 - b. effective throat
 - c. root penetration
 - d. depth of fusion
 - e. weld interface
68. All but which of the following will result in the elimination or reduction of residual stresses?
- a. vibratory stress relief
 - b. external restraint
 - c. thermal stress relief
 - d. peening
 - e. post weld heat treatment
69. The use of preheat will tend to:
- a. result in a wider heat affected zone
 - b. produce a lower heat affected zone hardness
 - c. slow down the cooling rate
 - d. reduce the tendency to produce martensite in the heat affected zone
 - e. all of the above
70. Which of the following discontinuities is less likely to be seen visually?
- a. toe crack
 - b. undercut
 - c. lamellar tear
 - d. overlap
 - e. none of the above
71. All but which of the following processes may result in the presence of slag inclusions in the completed weld?
- a. SMAW
 - b. PAW
 - c. FCAW
 - d. SAW
 - e. none of the above

72. Endurance limit is an expression for what type of testing?

- a. fatigue
- b. hardness
- c. soundness
- d. tension
- e. none of the above

73. Tensile strength and ductility are dependant on the orientation of the metal as it went through the rolling mill. Which of the following statements is true about the direction of rolling?

- a. the plate has the weakest properties (ductility and tensile strength) in the rolling direction
- b. the plate is strongest along the "Y" direction perpendicular to the rolling direction
- c. the direction of rolling has little effect on the strength of the rolled plate
- d. none of the above

74. After welding a procedure qualification test plate, it is found that the test failed the impact tests in the HAZ due to excessive grain growth. Which of the following changes would improve the impact properties in the HAZ?

- a. decrease the travel speed
- b. increase the preheat temperature
- c. increase the travel speed
- d. increase the amperage
- e. all of the above

75. Which of the following will produce the greatest amount of penetration using the GTAW process?

- a. AC
- b. DCEP
- c. ACEN
- d. DCEN
- e. penetration is not a function of current or polarity with the GTAW process