



1. True or False: The most common method for achieving atomic cleanliness is to undergo a mechanical cleaning process (such as scraping or machining).
 - a. True
 - b. False

2. Which of the following is true about soldering?
 - a. It is a group of welding processes that has materials that melt at temperatures above 840° F (450° C).
 - b. Other than the temperature at which it occurs, soldering is essentially the same as brazing.
 - c. Both a and b
 - d. Neither a nor b

3. Which of the following weld types can be used in butt joints?
 - a. Fillet welds
 - b. Groove welds
 - c. Plug and slot welds
 - d. All of the above

4. True or False: Steel is a perfectly isotropic material.
 - a. True
 - b. False

5. Which of the following connections would be least susceptible to a stress raiser?
 - a. A PJP groove weld in a butt joint, transferring a tensile force
 - b. A CJP groove weld, with backing left in place, at a beam bottom flange-to-column flange connection, transferring cyclic force
 - c. A CJP groove weld with backing left in place in a butt joint, transferring a tensile force
 - d. A CJP groove weld at the corner of a built-up tube, with discontinuous backing

6. A good welded connection recognizes that commercial materials will be subject to geometric variations. What standard provides geometric cross-sectional tolerances?
 - a. ASTM A6
 - b. ASTM A36
 - c. ASTM A992
 - d. AISC 360



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7. For what range of skew angle should the engineer specify effective throat rather the fillet weld leg size, for a tee joint?
 - a. Less than 80 degrees or larger than 100 degrees
 - b. Less than 60 degrees or larger than 100 degrees
 - c. Less than 60 degrees or larger than 120 degrees
 - d. Less than 45 degrees or larger than 120 degrees

8. Which of the following is a reason that a CJP groove weld may not be prequalified?
 - a. The root opening is too narrow
 - b. The backing material is not steel
 - c. Backgouging is not performed for a two-sided weld
 - d. All of the above

9. Flare V and flare bevel groove welds are typically associated with which of the following structural elements?
 - a. Angles
 - b. Channels
 - c. HSS
 - d. Plates thinner than 2 inches

10. True or False: Cold cracks, such as underbead cracks and transverse cracks, are avoided by default when welds are made in ambient temperatures higher than 50 degrees F.
 - a. True
 - b. False

11. True or False: To achieve a high notch toughness, one must seek a cooling rate that is neither too high, nor one that is too low.
 - a. True
 - b. False

12. Where is lamellar tearing typically located?
 - a. Along the centerline of the weld surface
 - b. In the heat-affected zone
 - c. In the base metal outside of the heat-affected zone
 - d. In the root pass of the weld



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13. At reentrant corners at copes, which of the following will have the more restrictive (lower allowable stress range) fatigue category?
 - a. Reentrant corner radius greater than or equal to 1 in., ground to bright metal surface
 - b. Reentrant corner radius less than 1 in., but greater than 3/8 in.

14. Which of the following stress categories does not have a fatigue threshold?
 - a. A
 - b. C'
 - c. E'
 - d. F

15. True or False: Fatigue is a concern for cold structures because fatigue tests have shown much faster fatigue crack growth rates at low temperatures.
 - a. True
 - b. False

16. True or False: There were no collapses of steel framed buildings during the 1994 Northridge earthquake discussed in session 6.
 - a. True
 - b. False

17. As required by AISC 358-16 / 358s1-18, at which of the following locations shall the backing, used for complete-joint-penetration groove welds, be removed?
 - a. Continuity plates
 - b. Beam bottom flange at connection to column
 - c. Beam top flange at connection to column
 - d. All of the above

18. Which of the following are prohibited in the protected zone?
 - a. Stud welds
 - b. Puddle welds
 - c. Erection aids
 - d. All of the above

19. True or False: Specifying steels with high notch toughness is the sole means to ensure fracture-resistant structures in cold temperatures.
 - a. True
 - b. False



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20. Which of the following methods might be used to mitigate lamellar tearing?
- Buttering
 - Contouring and blending
 - Heat shrinking
 - Plug welding
21. What reason was discussed for why the force being transmitted through a welded connection of a rectangular HSS might not be uniformly distributed?
- The flexural stiffness of the wall varies across the width of the rectangular HSS
 - The effective throat of the weld varies across the width of the rectangular HSS
 - The residual stresses from the weld causes early onset of yielding when the wall of the rectangular HSS is stressed
22. Which type of inspection task, from AISC 360 Chapter N, is to be done for each welded joint?
- Observe tasks
 - Perform tasks
 - Both a and b
23. True or False: Plug welding is a recommended means of restoring the full cross-sectional strength of a member with mislocated holes.
- True
 - False
24. Why are some F1554 grades problematic for welding?
- No controls on carbon or alloy content
 - No controls on phosphorous content
 - No controls on sulfur content
 - All of the above

