1. The available tensile strength is found by applying the resistance factor or safety factor to the
   a. Nominal yield strength
   b. Nominal rupture strength
   c. Lowest nominal yield or rupture strength
   d. Both the nominal yield and rupture strength
   e. None of the above

2. Three areas are defined for use in design of tension members. Which is used when calculating
   nominal rupture strength?
   a. Gross area
   b. Net area
   c. Effective net area
   d. All of the above
   e. None of the above

3. Which of the following is true when considering a chain of holes in a tension member
   a. The chain that includes the largest number of holes is always critical
   b. The chain that results in the greatest net area is always critical
   c. The chain that includes a diagonal path always results in a greater area than a
      chain with the same numbers of holes along a straight line.
   d. A chain without any diagonal is always critical
   e. None of the above

4. The shear lag factor accounts for
   a. Holes in outstanding elements of a tension member
   b. Outstanding elements without holes near the middle of a tension member
   c. Elements that otherwise would be yielding
   d. Unattached elements at a connection
   e. None of the above

5. The lower bound on the effective net area is
   a. The ratio of gross area of attached element to gross area of member times the
      net area.
   b. 0.6A_n for a single angle
   c. 0.75A_g
   d. 1.0A_n
   e. None of the above
Basic Steel Design
Quiz for Session 2: Tension Members – February 4, 2020
Due: March 3, 8:00 a.m. EST – Submit through the online form

6. Determine the effective net area for an L6x6x½ with a line of 6 – ¾ in. bolts in one leg and spaced at 3.0 in.
   a. 5.77 in.$^2$
   b. 5.33 in.$^2$
   c. 4.74 in.$^2$
   d. 2.77 in.$^2$
   e. 2.67 in.$^2$

7. Determine the design tensile strength (LRFD) for the L6x6x½ A36 angle given in problem 6.
   a. 187 kips
   b. 206 kips
   c. 208 kips
   d. 275 kips
   e. 289 kips

8. Determine the minimum thickness L4x4 A36 to carry an LRFD required tensile strength, $P_u = 100$ kips. ($P_a = 66.7$ kips for ASD). Use a single row of bolts in one leg so that $A_e = 0.8A_g$
   a. 5/8
   b. 1/2
   c. 7/16
   d. 3/8
   e. 5/16

9. Block shear strength is partially determined by the combination of which limit states?
   a. Tension rupture and shear lag
   b. Tension yield and shear yield
   c. Tension rupture and shear yield
   d. Tension yield and shear lag
   e. None of the above

10. According to the AISC Specification, an eyebar is designed for which of the following limit states?
    a. Yielding of the body
    b. Rupture of the effective net area
    c. Shear of the pin
    d. Bearing of the pin on the eyebar
    e. All of the above

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