Modern Methods for Learning Basics of Structural Stability: From Behavior to Practice
Session 8: Behavior of Structural Systems – Practical Considerations – December 8, 2020
Due: January 5, 2021, 8:00 a.m. EST – Submit through online form

1. Which of the five basic stability requirements are addressed (at least in part) by the 0.8 stiffness reduction factor when using the direct analysis method?
    a. Consider geometric imperfections
    b. Consider stiffness reduction due to inelasticity
    c. Consider uncertainty in strength and stiffness
    d. All of the above

2. Which of the five basic stability requirements are addressed (at least in part) by the effective length factor when using the effective length method?
    a. Consider geometric imperfections
    b. Consider stiffness reduction due to inelasticity
    c. Consider uncertainty in strength and stiffness
    d. All of the above

3. Which of the following AISC 360-16 parts contain stability design methods that can be used?
    a. Chapter C
    b. Appendix 1
    c. Appendix 7
    d. All of the above

4. Which of the following was part of the problem statement for Learning Module 9?
    a. A36 material
    b. W24x76 beam with unbraced length of 20 ft
    c. W24x76 beam bending about its minor axis
    d. W12x58 column bending about its minor axis

5. True or False: The ratio of maximum second-order drift to maximum first-order drift may be approximated by the B_2 multiplier.
    a. True
    b. False

6. True or False: In Learning Module 9, one was able to linearly extrapolate the load demands from Case 1 to directly find the correct load demands (in Case 2) that correspond to a column demand-to-capacity ratio of 1.0.
    a. True
    b. False

7. By viewing the results of the frame in Learning Module 9, Cases 1 and 3, how did the analysis with notional loads compare with one where system imperfections were modeled directly?
    a. The analysis with system imperfections directly modeled was conservative, with about 10 percent higher moments and axial forces.
    b. The analysis results were very close to one another, with moments and axial forces different by much less than one percent.
    c. The analysis with notional loads was conservative, with about 10 percent higher moments and axial forces.

8. According to the speaker, which of the following represented the last hurdle for the U.S. steel community to adopt inelastic analysis and design?
    a. Research to gain understanding of residual stresses
    b. Adoption of a limit state design philosophy (i.e., LRFD)
    c. Creation of graphical user interfaces
    d. Availability of sufficient computing hardware

9. In the case study presented of the office building retrofitted with viscous dampers, what type of analysis did the engineers perform?
    a. Linear buckling analysis
    b. Pushover nonlinear analysis
    c. Nonlinear time history analysis
    d. Approximate second-order analysis with effective length method

10. True or False: According to the speaker, a good use of computing power in the future would be to add to the number of load combinations.
    a. True
    b. False