Modern Methods for Learning the Basics of Structural Stability: From Behavior to Practice
Session 4: Behavior of Flexural Members – Practical Considerations – October 27, 2020
Due: November 24, 2020, 8:00 am EST – Submit through the online form

1. True or False: The AISC flexural strength curve corresponds to $C_b = 1.0$.
    a. True
    b. False

2. In the UT Austin test setup discussed, what deformations were restrained at the ends of the beam being tested?
    a. Twist
    b. Translation
    c. Warping
    d. Both a and b
    e. Both b and c

3. In the UT Austin test setup discussed, what type of external loads were applied to the test beams?
    a. Horizontal loads
    b. Vertical loads
    c. Eccentric horizontal loads
    d. Both a and b

4. In Learning Module 4, for the case where $L_b < L_p$, at what location(s) in the beam span did a plastic hinge form?
    a. At midspan only
    b. At midspan and at each end of the beam
    c. Over the entire length of the beam
    d. A plastic hinge did not form

5. In the plot comparisons for Learning Module 4, which of the following finite element analyses by MASTAN2 perfectly matched the theoretical lateral-torsional buckling (LTB) plot?
    a. Elastic critical
    b. No L/1000 + No Partial Yielding
    c. L/1000 + No Partial Yielding
    d. L/1000 + Partial Yielding

6. Based on a comparison of a pair of analyses that account for out-of-straightness and partial yielding in the W14x53 beam, what was the difference between a warping-continuous analysis and the theoretical warping-free (over the span) analysis?
    a. The warping-free analysis resulted in a significantly higher flexural strength.
    b. The two analyses resulted in about the same flexural strength.
    c. The warping-continuous analysis resulted in significantly higher flexural strength.

7. True or False: According to the finite element analyses presented for the W14x53 beam, fixing the end connections for warping results in about a 30 percent increase in the flexural strength for an unbraced length of about 18 feet.
    a. True
    b. False

8. What type of bridge was presented in the case study?
    a. Cable-stayed bridge
    b. Suspension bridge
    c. Tied arch bridge
    d. Twin tub girder bridge

9. In the case study presented, the bridge had stiffening trusses. Which of the following describes their role in the project?
    a. They were being replaced in sections.
    b. They were to support the bridge during construction.
    c. They were temporarily connected to the floor beams.
    d. All of the above

10. What is the yield stress of the A7 steel floor beams in the case study?
    a. 25 ksi
    b. 30 ksi
    c. 35 ksi
    d. 36 ksi