Fundamentals of Earthquake Engineering for Building Structures
Session 6: Steel Systems – March 22, 2021
Due: April 19, 2021, 8:00 am EDT – Submit through the online form

Pick the best answer

1) In a moment frame the seismic shear in the beam is determined by
   a) Statics, assuming the formation of plastic hinges at each end of the beam
   b) The shear capacity of the beam

2) In a moment frame the moment at the beam centerline is likely to be
   a) Close to its maximum
   b) Close to zero

3) Panel zone flexibility can be modeled by
   a) Introducing a rotational spring connecting the beam and the column
   b) Introducing a 4-bar assemblage with a diagonal spring
   c) Modeling beams and columns without rigid end offsets and allowing the added flexural flexibility substitute for panel-zone flexibility
   d) All of the above

4) In a moment frame the seismic shear in the columns is determined by
   a) Statics, assuming the formation of plastic hinges at each end of the beam and inflection points at mid-height of the column
   b) Statics, assuming the formation of plastic hinges at each the top and bottom of the column

5) Weld backing at the bottom flange is more problematic than at the top flange because
   a) The unfused region of the backing is at the extreme fiber
   b) Local bending of the flange increases tension at the extreme fiber when the bottom flange is in tension
   c) Weld procedures at the bottom flange require starting in the joint due to web obstruction
   d) The deck at the upper flange may slightly reduce demands on the weld
   e) All of the above

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6) In moment frame connections the plastic hinge location can be shifted away from the face of the column by
   a) Reinforcing the beam at the face of the column
   b) Adding continuity plates
   c) Weakening the beam at the desired hinge location
   d) A and C
   e) None of the above

7) In braced frames, gusset plates
   a) Can act as haunches, making the connection act as a rigid connection
   b) Always behave as pin connections

8) An elastic analysis of a braced frame will not capture
   a) Post-elastic seismic forces in interior columns of two-bay frames
   b) Post-elastic seismic flexural forces in beams in inverted-V-braced frames
   c) Post-elastic seismic axial forces in beams in two-story-X braced frames
   d) All of the above

9) Brace buckling entails
   a) Uniform compression yielding of the brace section
   b) The formation of plastic hinges in the brace and lateral deformation

10) Brace inelastic behavior differs between tension and compression in that
   a) Braces degrade significantly in their compression strength with cyclic loading
   b) Braces change length with tension yielding but buckle laterally in compression
   c) All of the above
   d) None of the above