Classical Methods of Structural Analysis
Quiz for Session 2: Strain Energy and Real Work – June 17, 2019
Due: July 8, 8:00 a.m. EDT – Submit through the online form

AISC Night School

1. When using virtual displacements to determine the reaction on a simply supported beam, the virtual displacement must:
    a. be up if the resulting reaction is up.
    b. be limited to no more than the span divided by 360.
    c. be the same at both reactions.
    d. All of the above are true.
    e. None of the above are true.

2. How much work is done when you lift a 10 lb box 3 ft off the floor?
    a. 0 ft-lbs
    b. 10 ft-lbs
    c. 15 ft-lbs
    d. 30 ft-lbs
    e. Not enough information is provided to determine

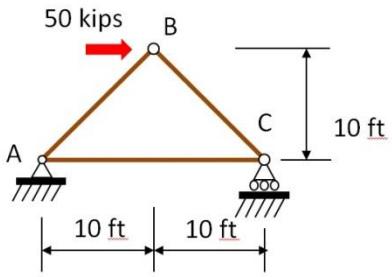
3. How much work is done when you carry a 10 lb box 10 ft to the other side of the room?
    a. 0 ft-lbs
    b. 30 ft-lbs
    c. 50 ft-lbs
    d. 100 ft-lbs
    e. None of the above

4. Which of the following is part of the strain energy equation for shear?
    a. EI
    b. AG
    c. AE
    d. JG
    e. None of the above

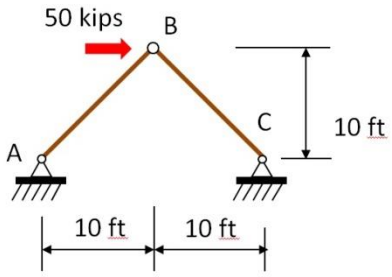
Classical Methods of Structural Analysis
Quiz for Session 2: Strain Energy and Real Work – June 17, 2019
Due: July 8, 8:00 a.m. EDT – Submit through the online form

5. The method of work permits the determination of deflection:
   a. under each load for a beam loaded at the ¼ points.
   b. at mid-span of a uniformly loaded beam.
   c. at any node of a truss, regardless of loading pattern.
   d. in the horizontal direction when a truss is loaded vertically.
   e. None of the above

Problem 6



Problem 7



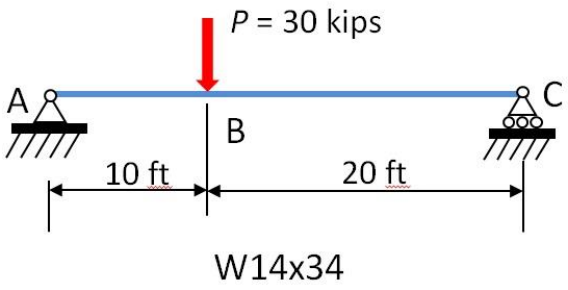
All members are 2.0 in.^{2} steel

6. The horizontal deflection at node B for the given structure is approximately:
   a. 0.20 in.
   b. 0.40 in.
   c. 0.60 in.
   d. 1.00 in.
   e. None of the above

7. For the structure of problem 6, remove member AC and replace the roller at C with a pin. The horizontal deflection at B is approximately:
   a. 0.10 in.
   b. 0.15 in.
   c. 0.20 in.
   d. 0.25 in.
   e. None of the above

Classical Methods of Structural Analysis
Quiz for Session 2: Strain Energy and Real Work – June 17, 2019
Due: July 8, 8:00 a.m. EDT – Submit through the online form

Problems 8 and 9



8. For the simple beam shown, the deflection at B considering only flexure is approximately:
   a. 0.60 in.
   b. 1.20 in.
   c. 2.30 in.
   d. 3.70 in.
   e. None of the above

9. For the simple beam from problem 8, the deflection at B considering only shear is approximately:
   a. 0.0008 in.
   b. 0.0012 in.
   c. 0.054 in.
   d. 0.036 in.
   e. None of the above

10. According to Maxwell's Law of Reciprocal Deflections, which of the following are correct statements?
   a. The vertical deflection at D due to a unit horizontal load at C is equal to the horizontal deflection at C due to a unit vertical load at D.
   b. The horizontal deflection at K due to a unit horizontal load at H is equal to the horizontal deflection at H due to a unit horizontal load at K.
   c. The rotation at E due to a unit horizontal load at C is equal to the horizontal deflection at C due to a unit moment at E.
   d. All of the above
   e. None of the above