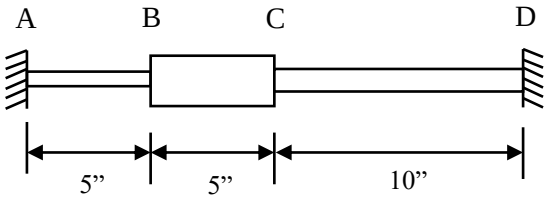
1. What can happen to structures or components if temperature is not considered in the design? Is it more critical to consider temperature for indeterminate or determinate bodies?

2. Refer to the figure below for the following problems. The 304 stainless steel rod AB, 2014-T6 aluminum rod BC, and C86100 bronze rod CD have no load in the members at 60°F. The cross-sectional areas are as follows: $A_{AB} = 1\ in^2$, $A_{BC} = 4\ in^2$, and $A_{CD} = 2.5\ in^2$.



   a. What is the average normal stress in each member when the temperature increases to 100°F?
   b. Member BC is initially 5 inches from the left. How far is member BC from the left once the temperature reaches 100°F.
   c. What is the average normal stress in each member when the temperature increases to 32°F?
   d. Member BC is initially 5 inches from the left. How far is member BC from the left once the temperature reaches 32°F.

3. Where do stress concentrations occur in buildings or machinery?
   a. Why are stress concentrations important?
   b. How can you mitigate stress concentrations?

4. Assume you have a long steel plate loaded in tension with a hole in the center. The thickness of the plate is 1 inch. The loads are applied parallel to the length and perpendicular to the width of the plate. Assume the allowable stress is 25 ksi.
   a. If the width of the steel plate is 5 inches and you need to support an axial force of 4000 lbs, how large can the hole diameter be?
   b. If the hole diameter is 1 inch and you need to support an axial force of 2000 lbs, how wide must the plate be?
   c. If the plate is 6 inches wide and you have a hole diameter of 0.5 inches, how much axial force can the plate support?