ME 323: Mechanics of Materials ***Homework Set H06***

Summer 2024 ***Assigned/Due: June 17/June 19***

A rod is made up of elements (1), (2), (3) and (4), with each element having a length of L, and the elements have outer diameters of d_1, d_2, d_3 and d_4, respectively. Element (2) is a core inside the tube element (3), as shown in the figure, and elements (1), (2)/(3) and (4) are connected in series. The elements have Young's moduli of: $E_1 = E_2 = E$ and $E_3 = E_4 = 2E$. C, D and H represent rigid connectors for the rod elements. Loads of $2P$, P and $3P$ act on connectors C, D and H, in directions shown on the figure below.

a) Determine the displacement of connector H.

b) Determine the stress in each element of the rod.