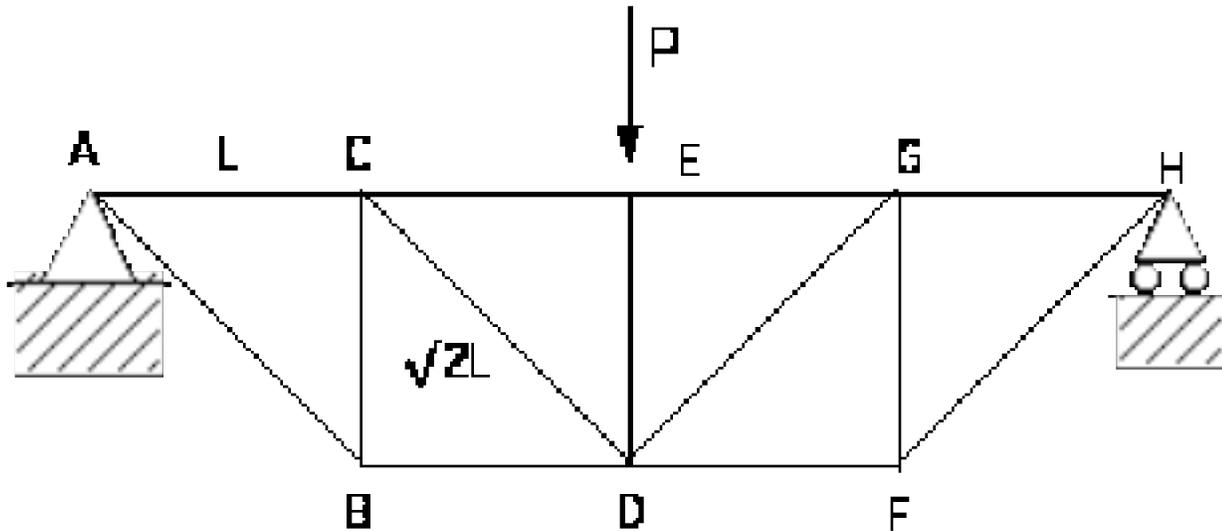


Problem M 11

For the truss structure and the loading shown below, you are to calculate the cross-sectional area of the bars to achieve both of the following design objectives:

- 1) The maximum stress in any of the members is not to exceed 200 MPa
- 2) The vertical deflection of point D is not to exceed 25 mm



Estimate the mass of the resulting structure. Does this seem reasonable?

All of the bars are to be made of tubes of Aluminum Alloy 7075, Young's modulus 70 GPa, density 2700 kg/m^3 . All tubes will have the same cross-sectional area.

List all of the assumptions you are making in your calculation. Suggest a means of reducing the mass of the structure further.