A triangulated mild-steel truss framework is formed from 100x100x10 RHS chords, 80x80x6 SHS internal struts and 100x20 flat-bar internal ties. The configuration and loading is shown in figure 2. State any assumptions you make in your analysis.

a) Assuming that the centroid of all connecting members coincide at nodes, calculate the sense (compression or tension) and forces in the members using the *method of joints* or the *method of sections*.
b) Assuming that the centroid of all connecting members coincide at nodes, calculate the midspan deflection using *Castigliano's second law* and a simplified method which accounts for the stiffness of the chords only.
c) Assuming that the centroid of all internal tie members are eccentric by 25mm at chord connections, calculate the local bending moment in the chords using statics, and sketch a bending moment diagram.
d) Produce a computer analysis to validate your calculations in part c).

If the trussed framework is now assumed to be analogous to a plate girder with web tension-field action (carrying the same loading). The flanges are 200mm x 20mm plate, the web is 8mm thick and the three web stiffeners are 90mm x 10mm (each side of web).

e) Use suitable methods to estimate the forces in the flanges, web stiffeners and web. Use a standard formula to calculate the midspan deflection.
f) Compare the results obtained and explain the differences.

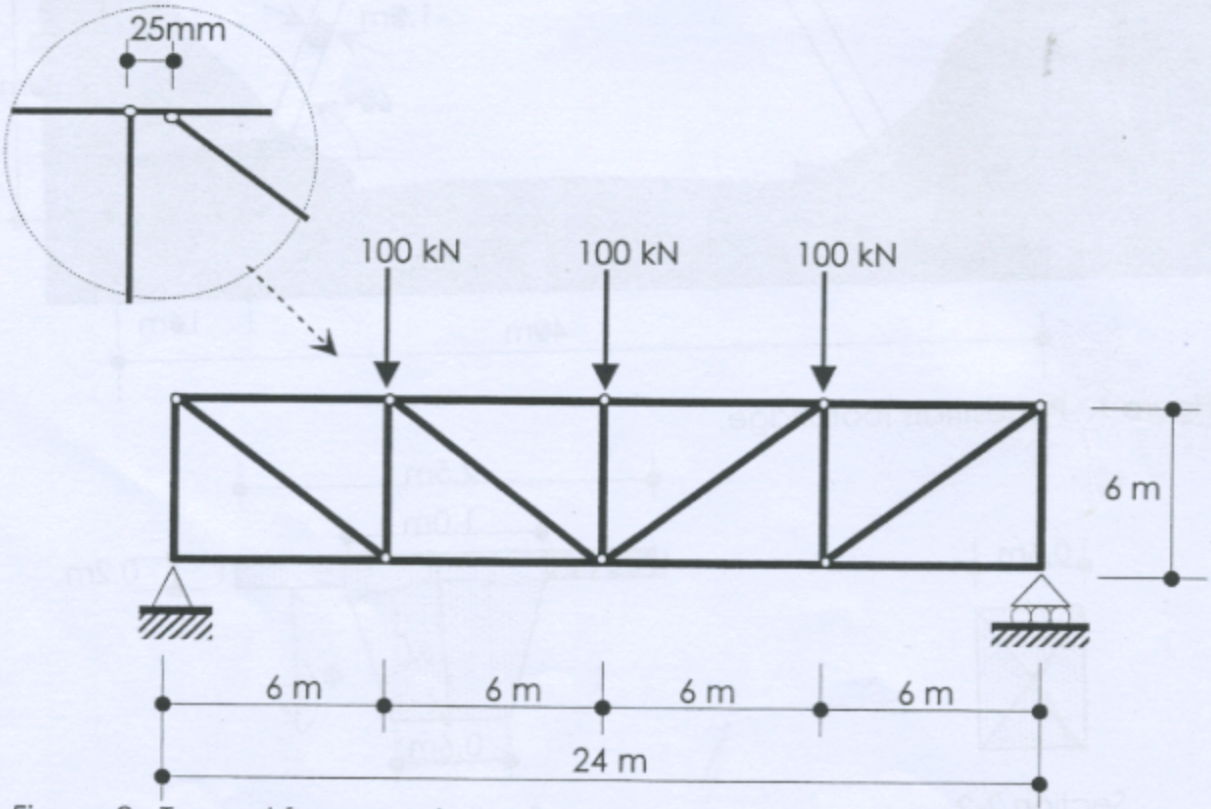

Figure 2. Trussed framework.