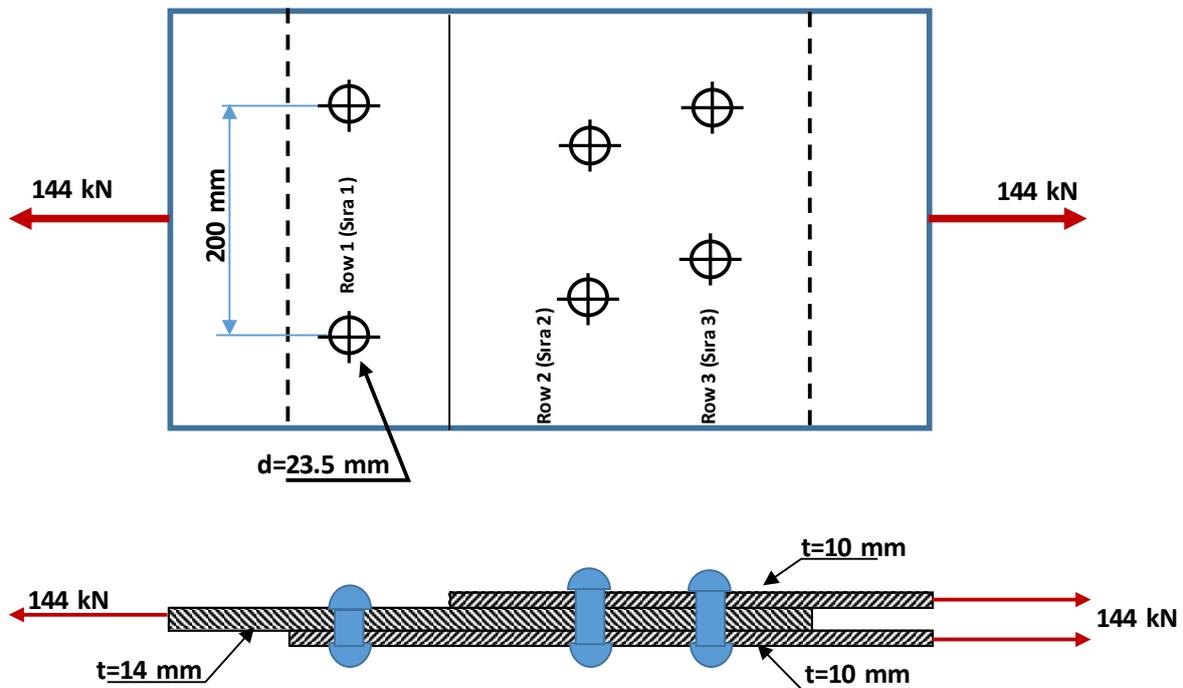Q.1. (40%) Determine the smallest NPI profile that can be used in members 1, 3, 5, 7, 10, 16 and 18. Allowable stress in tension is $\sigma = 260$ N/mm^2 and allowable stress in compression is $\sigma = 190$ N/mm^2
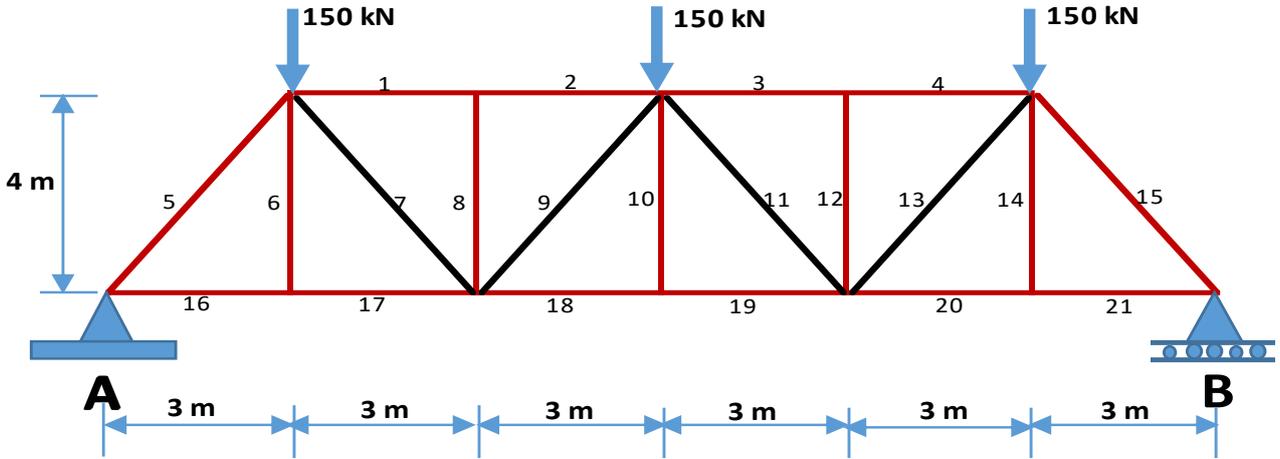
CEVAP (ANSWER)					
Çubuk Bar	Kuvvet Force	Gerilme Stress	Min Alan Min Area	Seçilen Profil Profile Chosen	Seçilen Profilin Alanı Area of the profile hosen
	kN	N/mm^2	mm^2		mm^2
1					
3					
5					
7					
10					
16					
18					

Q.2. (30%) A load of 144 kN acts on the repeating section of the triple-riveted butt joint in following figure. Length of section is 200 mm, diameter of rivet holes is 23.5 mm, thickness of main plate is 14 mm and of each cover plate is 10 mm.
  a) Determine the shearing, bearing, and tensile stresses developed in the joint.
  b) If steel plates are st37 quality and allowable tensile stress is 1.44 t/cm², check the steel plate and bolts are safe or not

Q.3. (30%) A beam shown in below figure. Left support is roller and right support is hinge. St37 steel material used for design of the beam. Determine the minimum NPI profile that can be used if allowable stress $\sigma = 220$ N/mm²
  a) Draw Shear Force, Moment and deflection diagrams for the beam.
  b) Determine the smallest NPI profile that can be used.