Machine Design Course for Communication / Electrical Department
Sheet 2 – Design of Bolts

Problem 1

Two plates 10 mm in thicknesses and subjected to a tensile load of F = 4000 N are connected by 4 bolts as shown in Figure 1. Compute the diameter of the bolts if the maximum stress in the bolts is 200 MPa

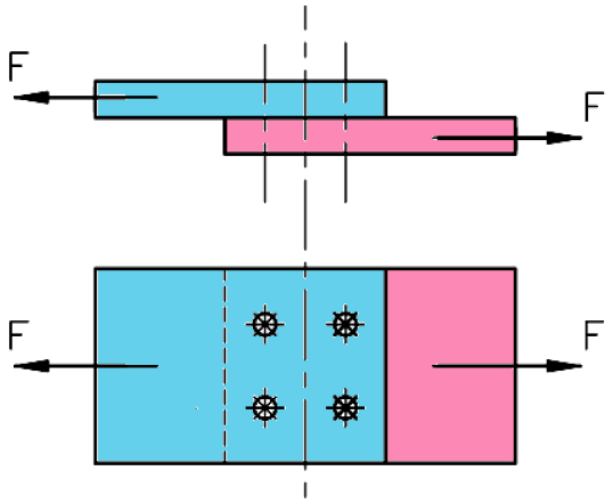

Figure 1.

Problem 2

Four bolts are used to secure the bracket to the wall as shown in Figure 2. All the dimensions are in millimeter. If the bolts are made of the steel having S_y=420 MPa, determine their size of bolts using factor of safety of 2.

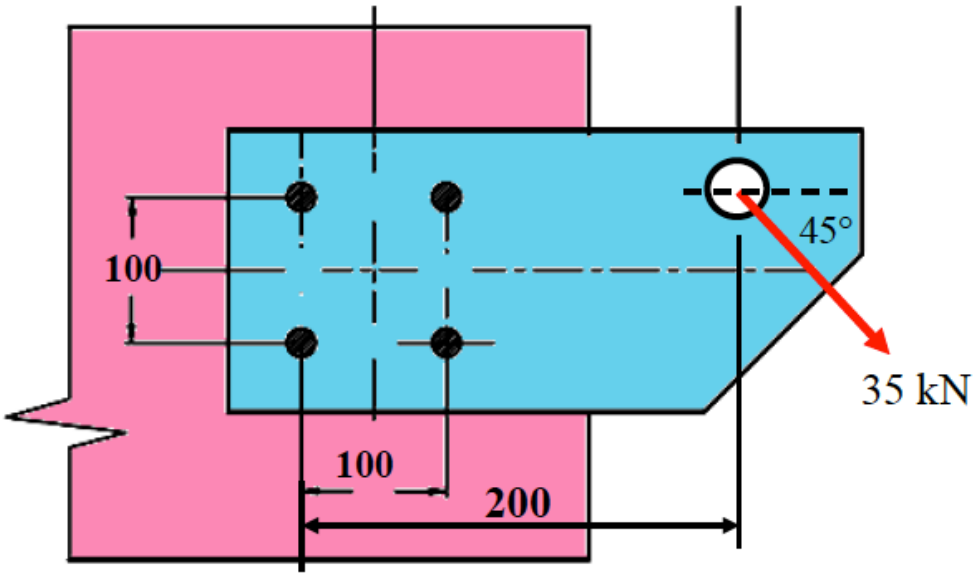

Figure 2.

Problem 3

Three bolts are used to secure the bracket to the wall as shown in Figure 3. All the dimensions are in millimeter. If the bolts are made of the steel having S_y=380 MPa, determine their size of bolts using factor of safety of 2.5.

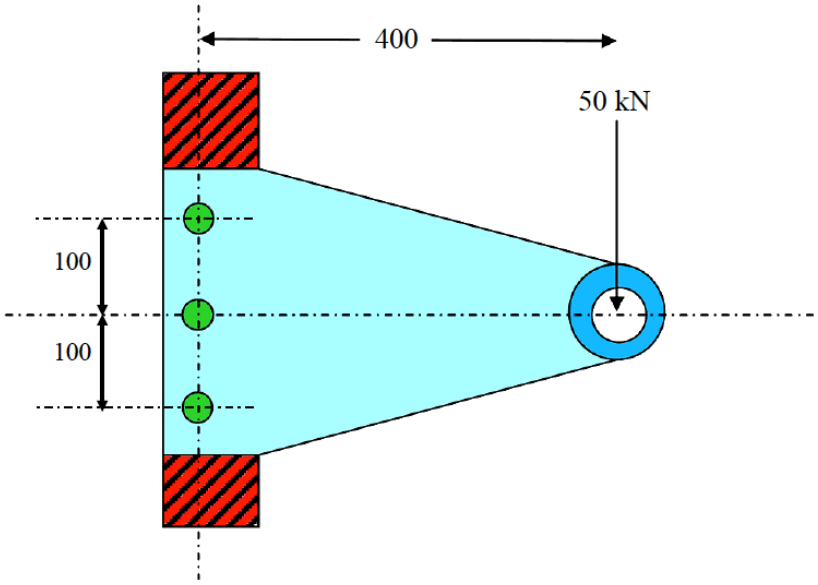

Figure 3.

Problem 4

The bracket shown in Figure 4 is secured to a 'C' column by means of three M16 through bolts having S_y=620 MPa, the bracket is subjected to vertical load of 16 kN. Determine the factor of safety for the bolts. Neglect the stresses due to initial tension in bolts. All the dimensions are in millimeter.

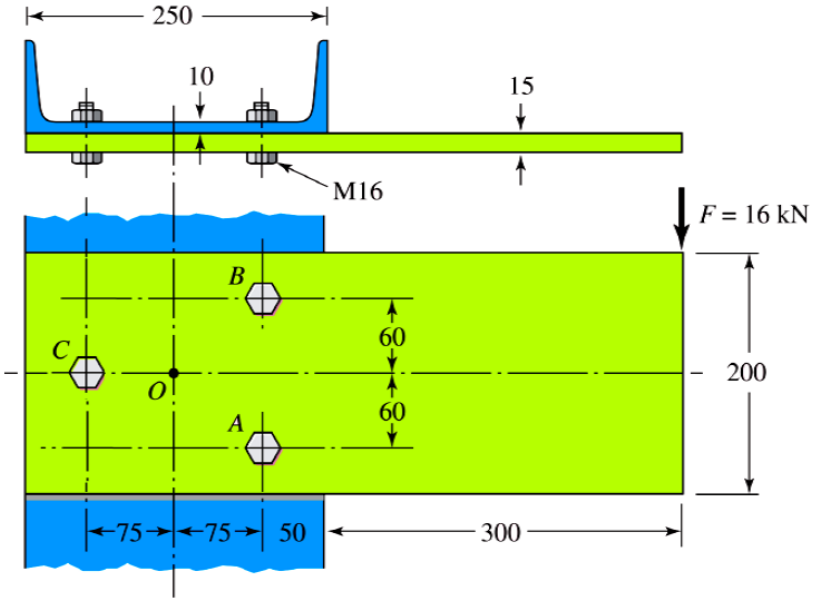

Figure 4.