Shear STRESSES

Question.1

For the section shown in Fig.1, draw the stress distribution due to a shearing force Q_y=20 t.

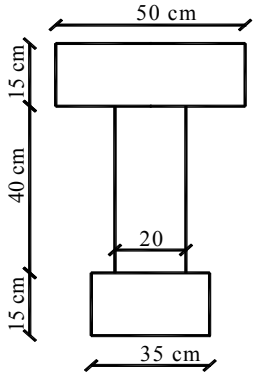


Fig.1

Question.2

For the section shown in Fig.2, draw the shear stress distribution due to a shearing force Q_y = 15t.

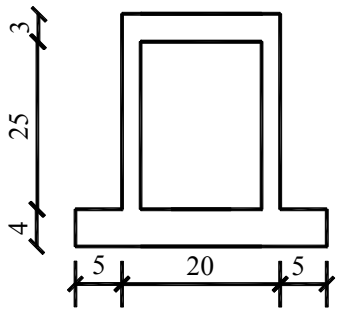


Fig.2

Question.3

For the hollow rectangular section shown in Fig.3, draw the shear stress distribution due to a shearing force Q_x= 20t and Q_y = 16t.

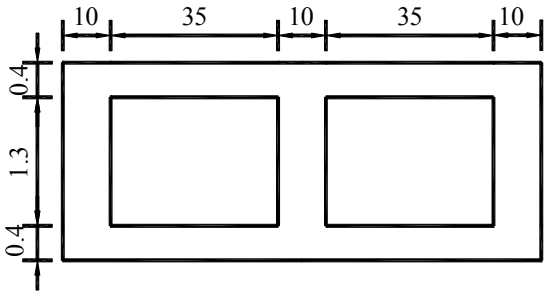


Fig.3

Question.4

For the beam shown in Fig.4, find the allowable value of P as governed by:

1- Maximum shear stress over the cross section is 0.8 t/cm^2

2- Allowable shear stress in rivet is 0.96 t/cm^2. Take the diameter of rivet 1.4 cm and spacing 8 cm a part.

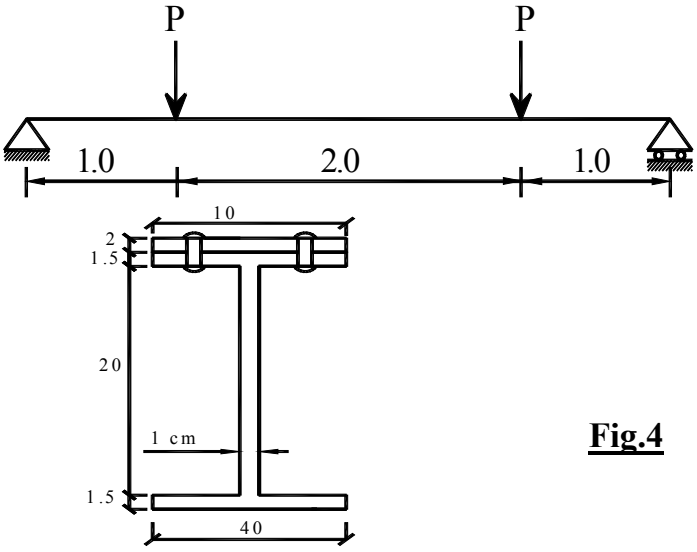


Fig.4

Question.5

For the structure shown in Fig.5, find the maximum safe load F for the two alternative cross sections to be used. If τ_{rivet} =0.96 t/cm^2, $\varnothing_{rivet}$ =2 cm, pitch= 10 cm, τ_{weld} = 1 t/cm^2, weld size = 1.5 cm.

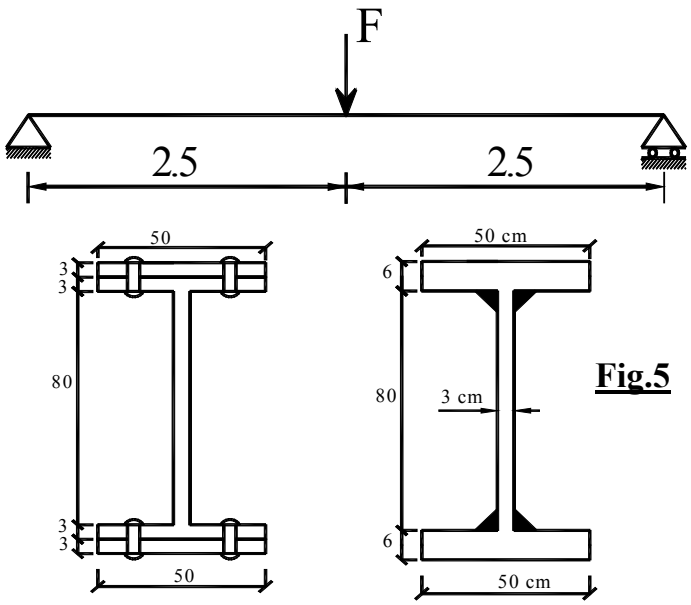


Fig.5

Question.6

For the structure shown in Fig.6, calculate the Maximum shear stress then draw the angle of twist diagram. Take G = 850 t/cm^2.

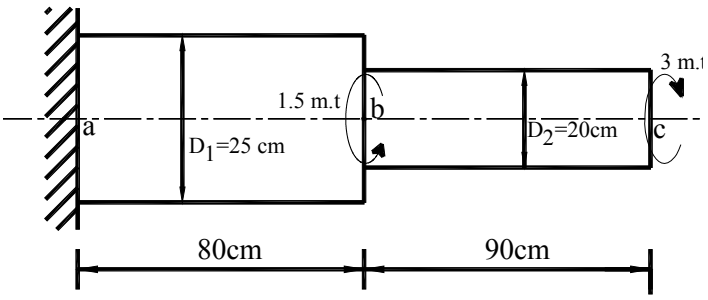


Fig.6

Question.7

For the shown beam it is required to:

1- Draw the torsional moment diagram.

2- Draw the twisting angle diagram.

3- Calculate the maximum shear stress. Take G= 800 t/cm^2.

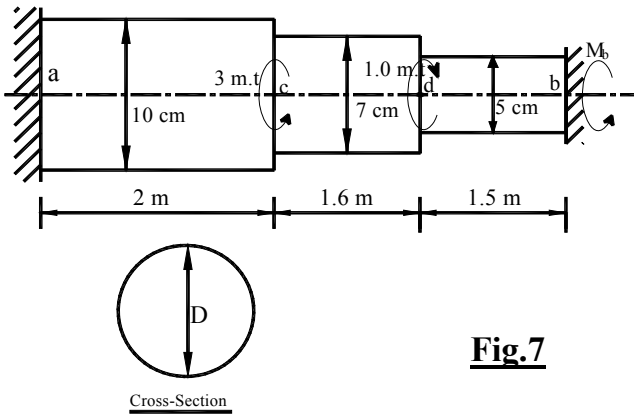


Fig.7

Question.8

For the shown riveted connection, calculate the shear stress and its direction at critical rivets, if the used rivet has Φ_{rivet}= 1.8 cm, pitch = 7cm.

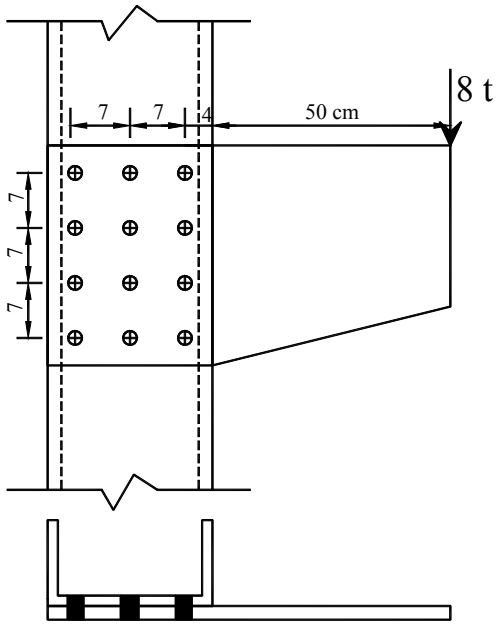


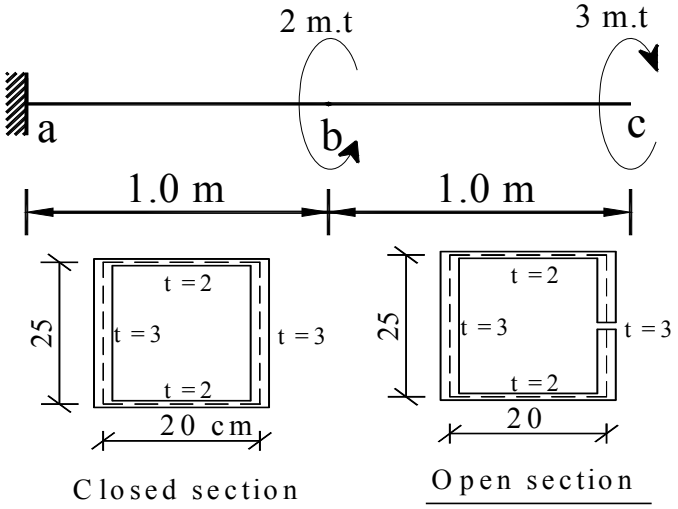
Fig.8

Question.8

The shown cantilever has a closed thin walled section. It is required to:

i- Calculate the maximum values shear stress and angle of twist.

ii- What will be the maximum values of shear stress and angle of twist if the cantilever cross section is replaced by an open section. Take G= 800 tlcm^2 .



Question.9

For the thin walled section shown in Fig.9, find the value of the vertical force P to get No torsion on the cross section.

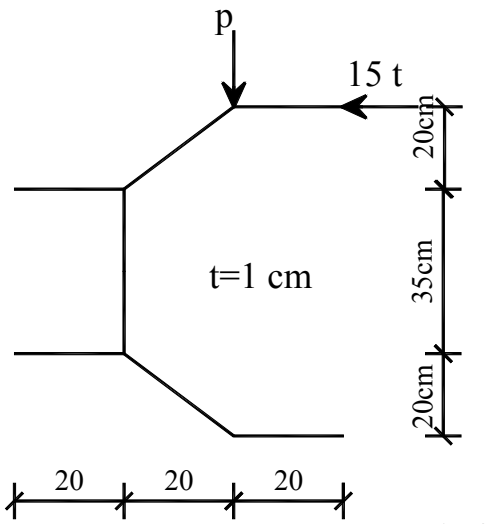


Fig.9

Question.10

For the thin walled section shown in Fig.10, find the position of shear center.

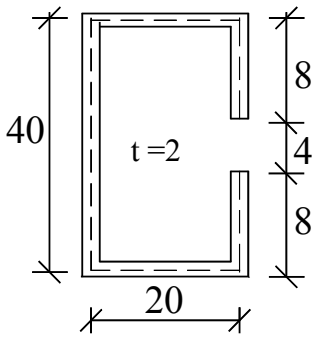


Fig.10