Sohage University | Theory of Structures
Second Year Civil | Faculty of Engineering
Civil Eng Department | Sheet No (3) | 2018-2019

NORMAL STRESSES

Question.1

For the structure shown in Fig.1, draw the normal stress distribution at section "S-S" then check the results by means of core. Take the unit weight 2.0 t/m^3.

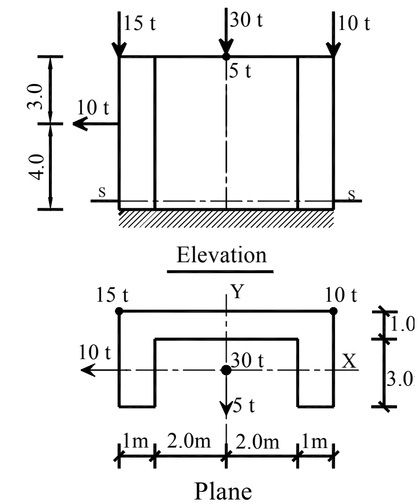

Fig.1

Question.2

For the cross section shown in Fig.2, draw the normal stress distribution.

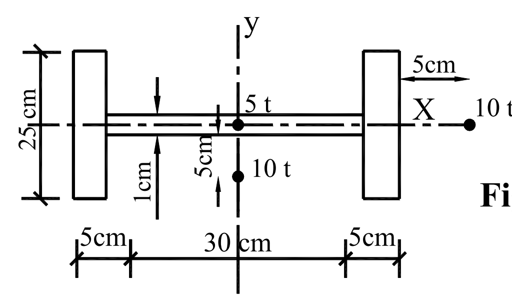

Fig.2

Question.1

For the structure shown in Fig.3, draw the normal stress distribution at section "S-S" then check the results by means of core.

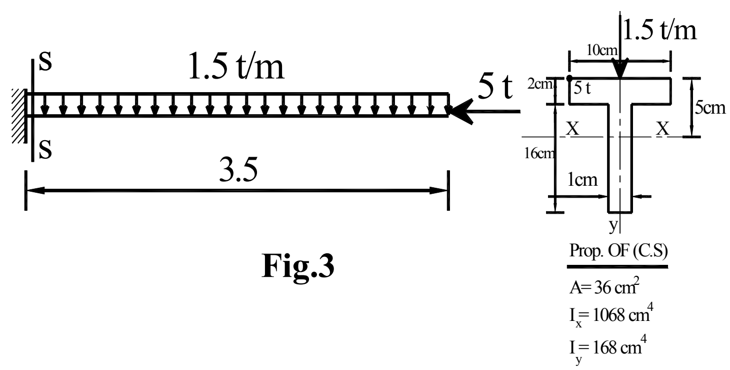

Fig.3

Question.4

For the structure shown in Fig.4, draw the normal stress distribution at section "S-S" then check the results by means of core.

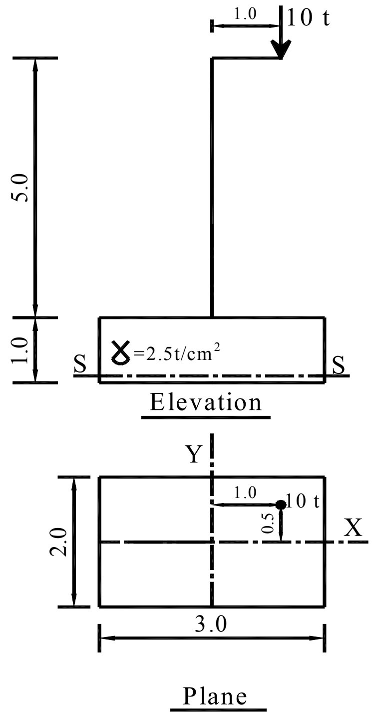

Fig.4

Question.5

For the frame shown in Fig.5, draw the normal stress distribution at section "A-A", "B-B". Each footing has a square cross section of 2 m side length. Weight of the footing is 2.2 t/m³.

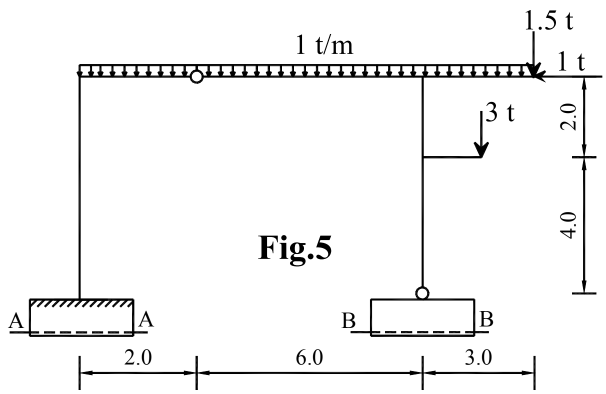

Fig.5

Question.6

For the beam shown in Fig.6, draw the normal stress distribution at section "S-S".

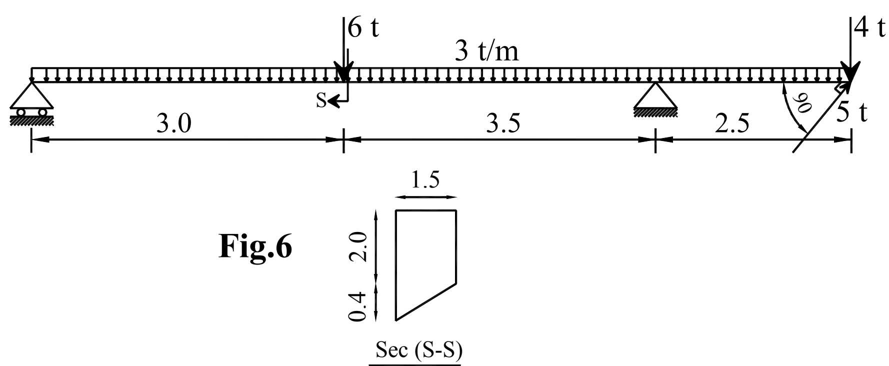

Fig.6

Question.7

The cross section shown in Fig.7 is subjected to a compressive P at the indicated location. Find the maximum value of P so that the maximum compressive stress may not exceed 100 kg/cm^2 and the maximum tensile stress 20 kg/cm^2. Check the results using core method.

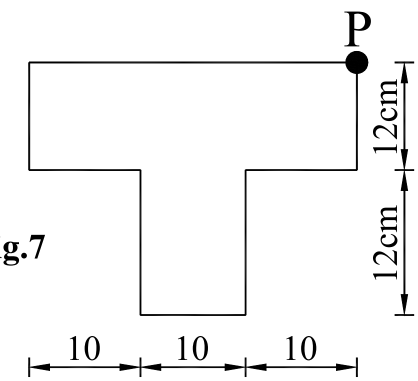

Fig.7

Question.8

For the structure shown in Fig.8:

a-Draw the normal stress distribution at sec A-A at the base if H=30t

b- Determine the maximum value of H if no tensile stress occurs at Sec S-S.

c- Check the results obtained in the above two cases by means of core.

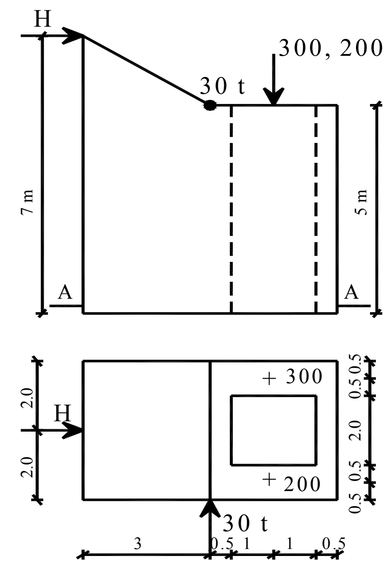

Fig.8

Question.9

The composite element shown in the Fig.9 consists of steel section having properties as indicated, and a concrete slab 20 cm thick. The modules of elasticity of steel and concrete are 2000 t/cm^2 and 200 t/cm^2 respectively. It is required to calculate the stresses induced due to each of the following straining actions, acting as indicated in the Fig.

(i) M= 60 t.m (ii) N_1 = - 100t

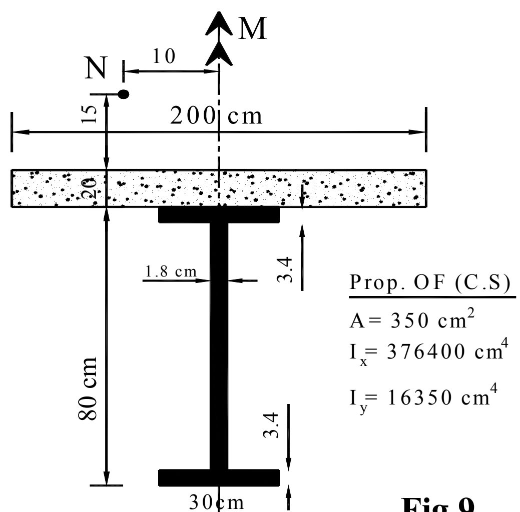

Fig.9

Question.10

A simple beam is composed of 2 materials A and B as shown in Fig.10, material A is a rectangular cross section 26×46 cm, E_A=210 t/cm^2, σ_{ten}= 20 t/cm^2, σ_{comp}= 70 t/cm^2. Material B is a hollow box section 26×46 cm internal dimension and 30×50 cm external dimension E_B=2100 t/cm^2, σ_{ten}= σ_{comp} = 1000 t/cm^2. Find the normal stress distribution on section 2-2 as a function of P, then find the maximum allowable load P, find also the part of P resisted by Material B.

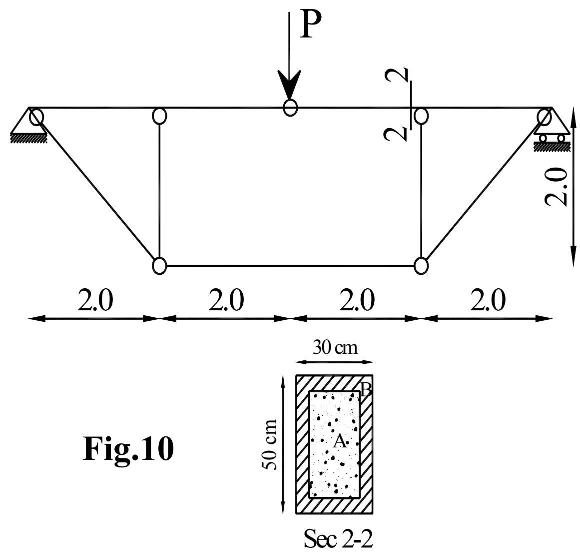

Fig.10

Question.11

The composite element shown in the Fig consists of steel section having properties as indicated, and a concrete slab 20 cm thick. The modules of elasticity of steel and concrete are 2000 t/cm^2 and 200 t/cm^2 respectively. It is required to calculate the stresses induced due to each of the following straining actions, acting as indicated in the Fig.

(i) M= 60 t.m (ii) N_1 = - 100t

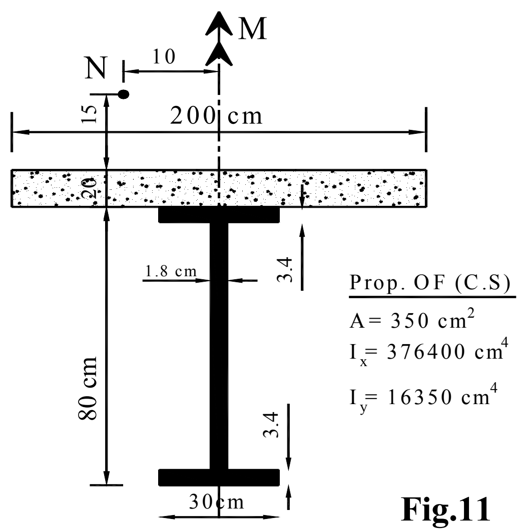

Fig.11