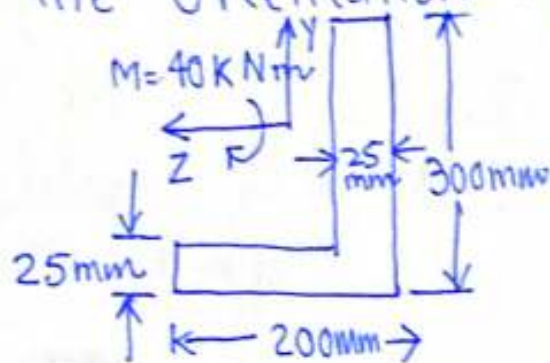


Unsymmetrical Bending of Beam & Curved Beams:

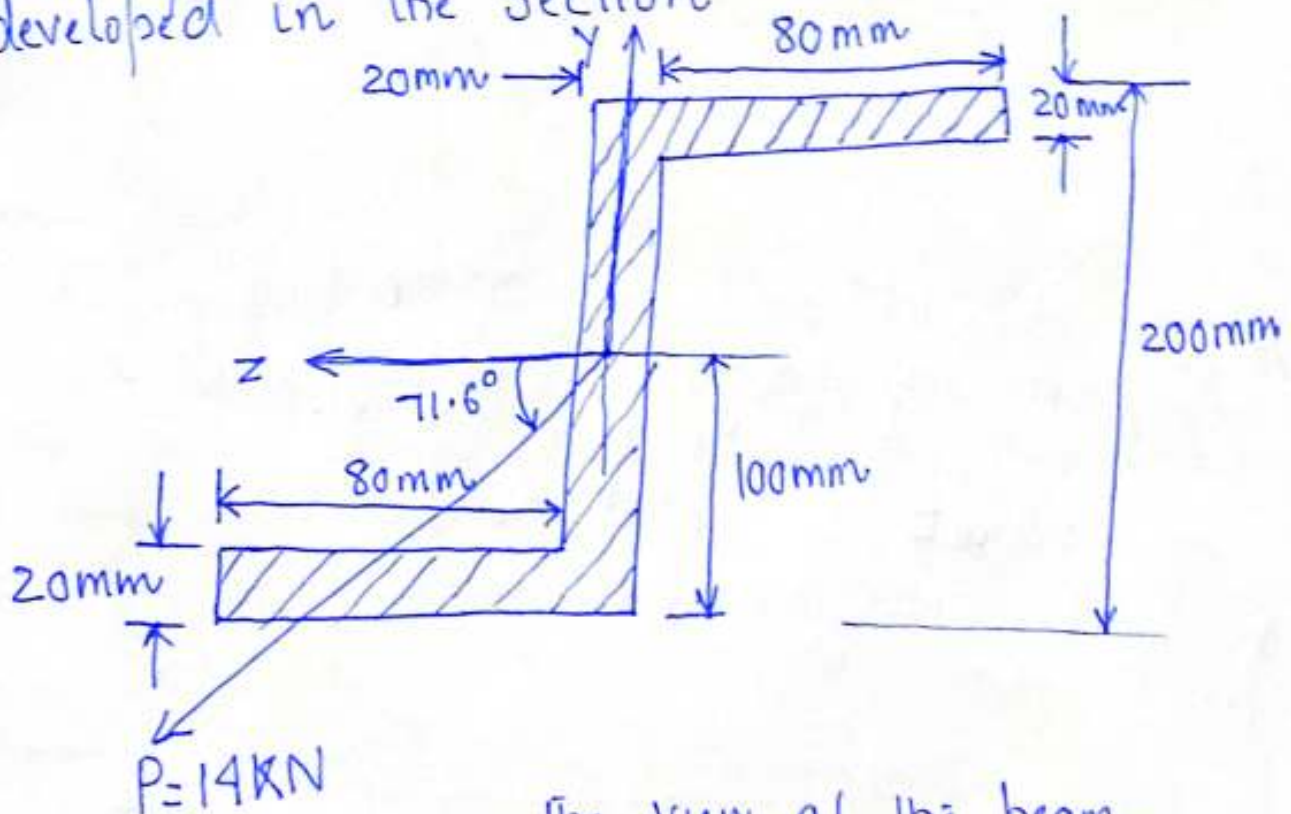
Qno: 1)

A beam with the section shown in Fig is subjected to bending. Calculate the maximum tensile & compressive stresses in the beam and determine the orientation of the neutral axis.



Qno: 2)

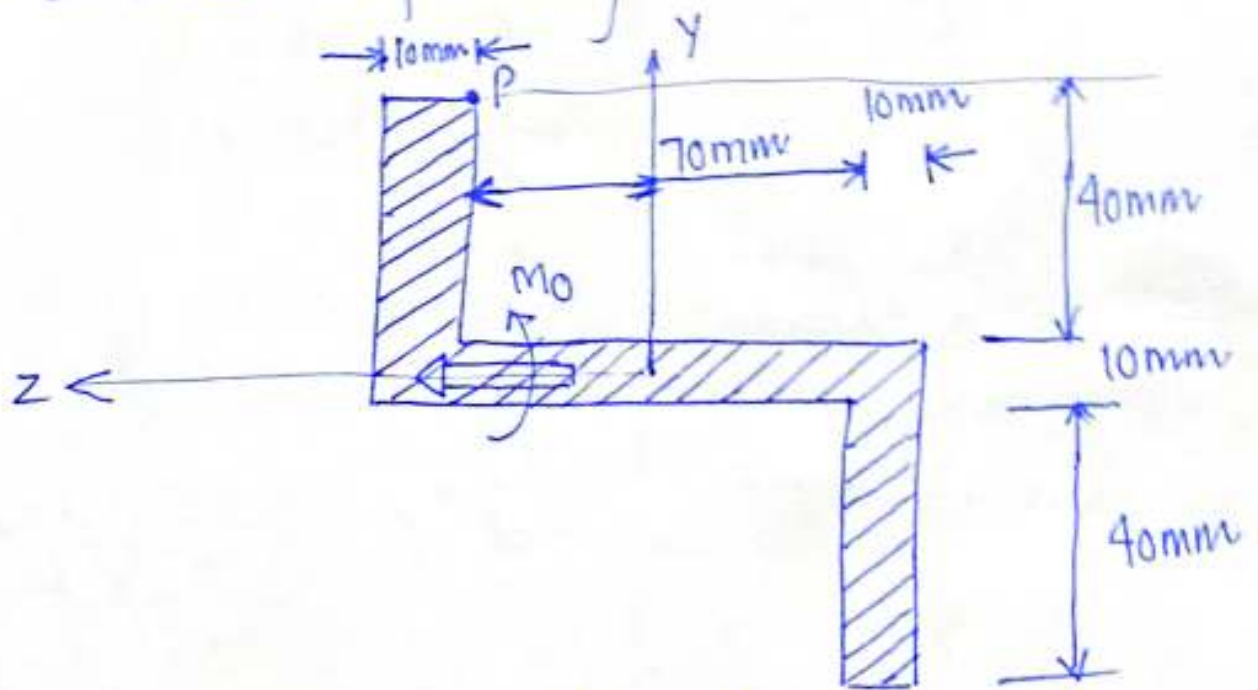
A steel-rolled section shown in Fig is used as a cantilever beam of length 2m. For the loading, calculate the maximum flexural stress developed in the section.



The view of the beam section shown here is when looked from the fixed end of the beam to its free end.

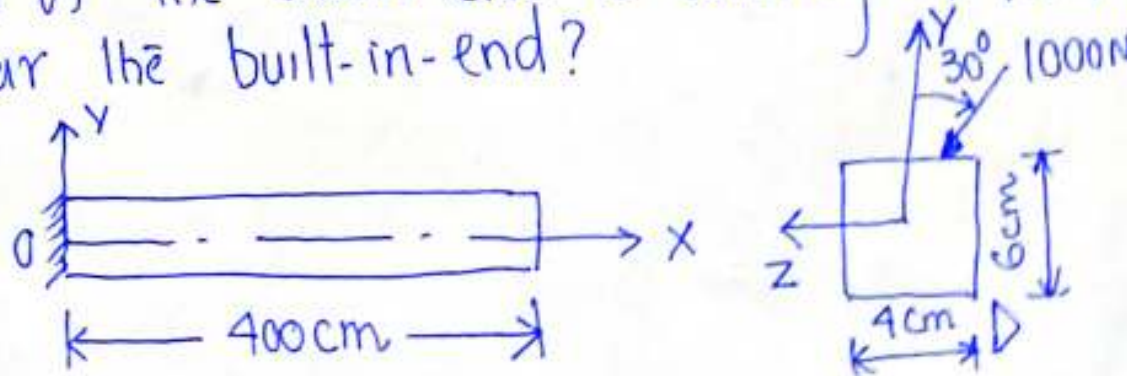
Qno: 3)

The Z-Section shown in fig is subjected to a bending moment M_0 . Calculate the largest value of M_0 , if the maximum bending stress is not to exceed 80MPa. Given that for the section, $I_{max} = 2.28 \times 10^6 \text{ mm}^4$ & $I_{min} = 0.29 \times 10^6 \text{ mm}^4$. Principal axes are 25.7° and 64.3° respectively.



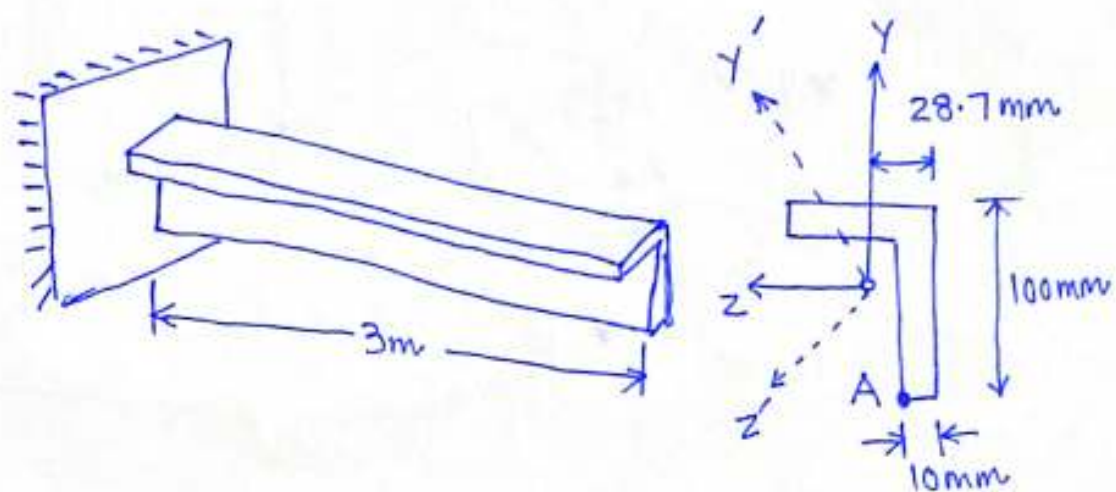
Qno: 4)

A cantilever beam of rectangular section is subjected to a load of 1000N which is inclined at an angle of 30° to the vertical. What is the stress due to loading at point D near the built-in end?



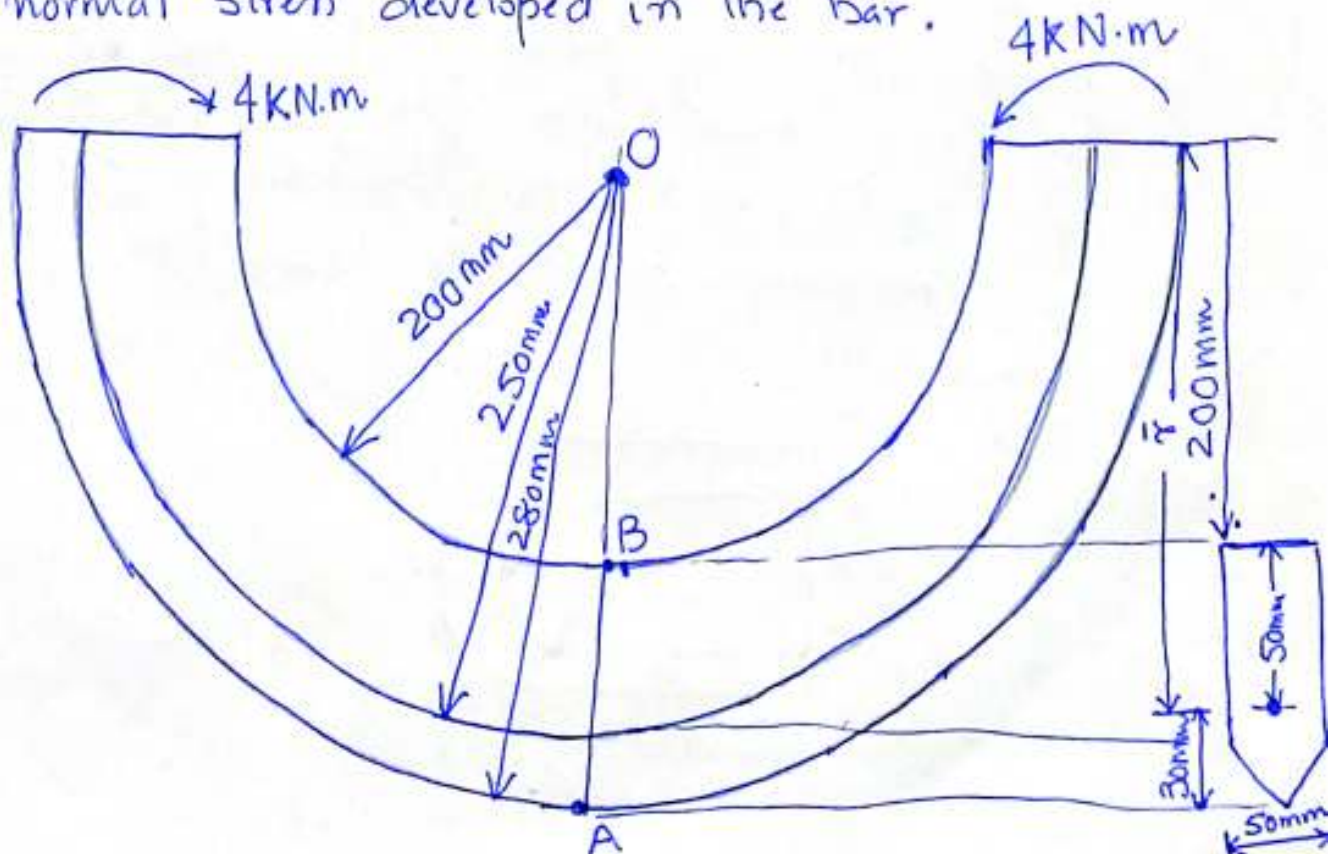
Qno: 5)

A beam of equal-leg angle section, shown in fig is subjected to its own weight. Determine the stress at point A near the built-in section. It is given that the beam weighs 1.48 N/cm . The Principal moments of Inertia are 284 cm^4 & 74.1 cm^4 .

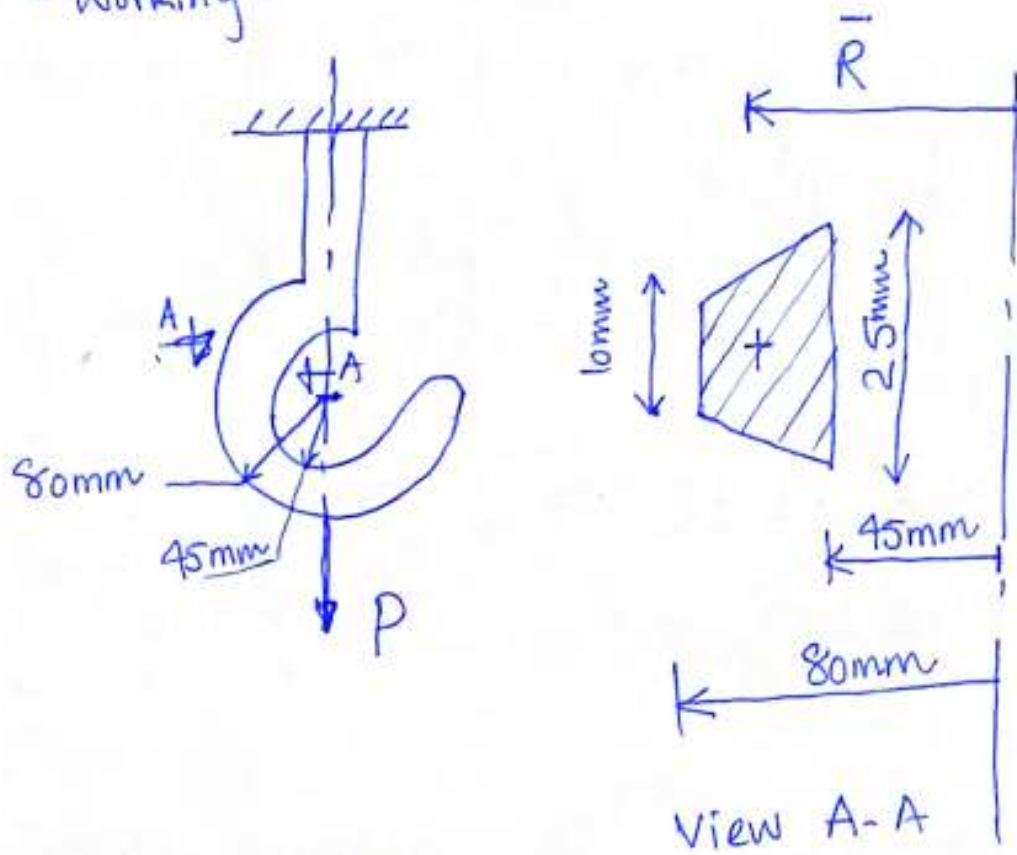


Qno: 6)

The curved bar has a cross-sectional area shown in fig. If it is subjected to bending moments of $4 \text{ kN}\cdot\text{m}$, determine the maximum normal stress developed in the bar.



Qno: 7) A Crane hook has a trapezoidal section as shown in fig. Calculate the maximum load to be carried by the hook if $\sigma_{\text{working}} = 150 \text{ MPa}$



Qno: 8) The frame shown in fig has a rectangular section. The frame is made of a steel having yield point stress $\sigma_{yp} = 430 \text{ MPa}$. The frame has been designed with factor of safety = 1.75 against yielding. Calculate the maximum allowable load P on the frame.

