

長庚大學九十七學年度研究所碩士班(含在職專班)招生考試試題

所別：機械工程所碩士班

考試科目：材料力學

注意：請詳細閱讀下列試題，並請標明題號依試題順序將答案書寫於答案卷上。

1. (20%) A circular rod of length L and diameter d hangs in a mine shaft and holds an ore bucket of weight W at its lower end. Please calculate the maximum stress if $L=40\text{m}$, $d=8\text{mm}$ and $W=1.5\text{kN}$.

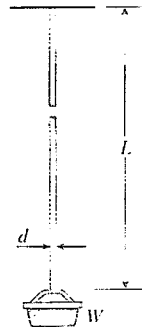


Fig. 1

2. (20%) Please calculate the distance H required for the lower joint of a timber truss so as not to exceed an allowable shear stress parallel to the grain of 825kPa along plane a-b.

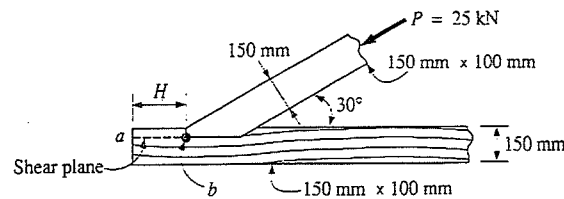


Fig. 2

3. (20%) A force of 15000 N is applied to the edge of the member shown in the figure. Neglect the weight of the member and determine the state of stress at points B and C.

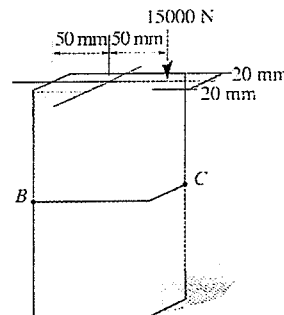


Fig. 3

4. (20%) An overhang beam of T-shaped cross section is loaded as shown in the figure. Please determine the maximum tensile and compressive bending stresses.

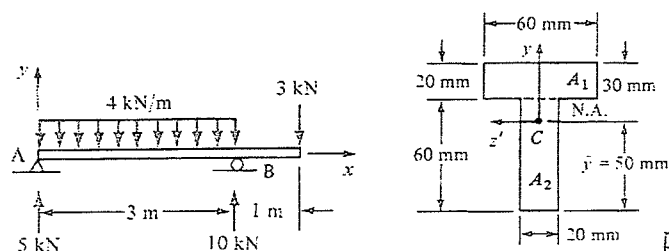


Fig. 4

5. (20%) The load on a propped cantilever beam AB of length L is parabolically distributed according to the equation $q=q_0(1-x^2/L^2)$, as shown in the figure. Please obtain the reactions of the beam and the equation of the deflection curve.

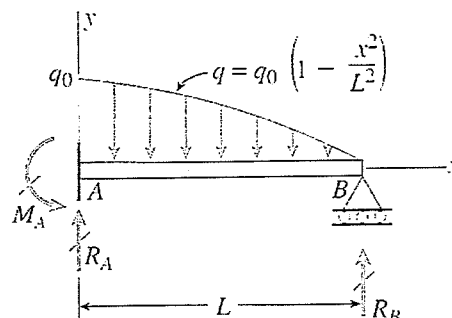


Fig. 5