1. The support ring of the traffic light shown in **Fig. 1** is acted by three forces-the weight of the traffic light (800KN), a force in cable A (F_A) and a force in cable B (F_B). If the resultant of the three forces is zero, determine the magnitudes of F_A and F_B. (25%)

2. A homogeneous book of weight 6.0KN rests in a bookshelf as shown in **Fig. 2**. The thickness of the book is small compared to the other dimensions shown the coefficient of friction at all surfaces is 0.35. Determine the minimum angle θ for which the book is in equilibrium. (25%)

3. Draw the shear and moment diagrams for the beam shown in **Fig. 3**. (25%)

4. There are normal and shear stresses on horizontal and vertical planes through the point, as shown in **Fig. 4**. Use Mohr's circle to determine (a) The principal stresses and the maximum shear stress at the point. (b) The normal and shear stresses on the inclined plane AB. (25%)
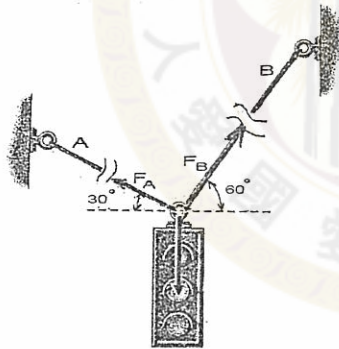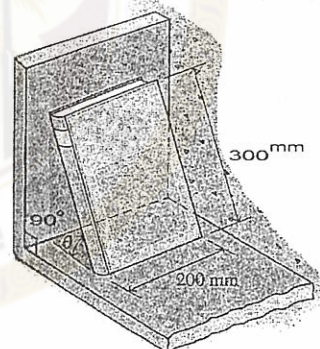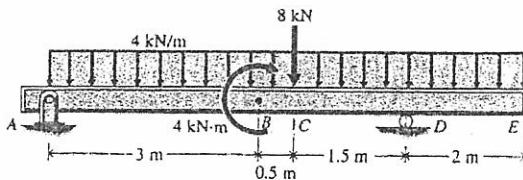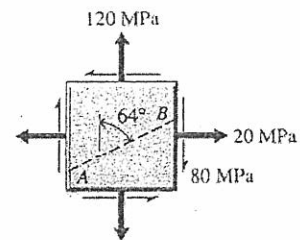

Fig. 1

Fig. 2

Fig. 3

Fig. 4

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