大同大學 101 學年度研究所碩士班入學考試試題

考試科目:材料力學　　所別:機械工程研究所　　

註:本次考試 不可以參考自己的書籍及筆記； 不可以使用字典； 可以使用計算器。

1. The torsional deformation of a steel shaft is to be 1° in a length of 700 mm when the shearing stress is equal to 70 MPa.Find the diameter of the shaft. Shear modulus G= 79300 MPa. (15 %)

2. Using an allowable stress of 160 MPa, determine the largest bending moment M that can be applied to the wide-flange beam as shown in Fig. P2. Neglect the effect of fillets. (15 %)

3. A plate 10"x10" is attached to two opposing walls. The walls are then moved so as rotation stretch the plate horizontally by 0.05" and to cause the right wall to move upward by 0.05" relative to the left wall as shown in Fig. P3. Determine the magnitude and orientation of the principal strain at the center of the plate (20 %)

(4) For the beam and loading shown in Fig. P4, determine the minimum required width, knowing that the grade of timer used, σ_{all}=12MPa and τ_{all}=1MPa. (20 %)

(5) Two forces, 5kN and 10kN, and a 1.4-kN · M couple are applied at the top of the 65-mm diameter cast iron post as shown in Fig. P5. Determine the principle stresses and maximum shearing stress at (a) point H, (b) point K. (15 %)

(6) For the beam and loading shown in Fig. P6, determne (a) the deflection at C, (b) the slope at end A. (15 %)

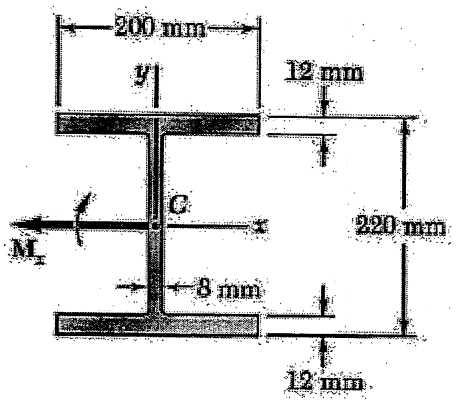

Fig. P2

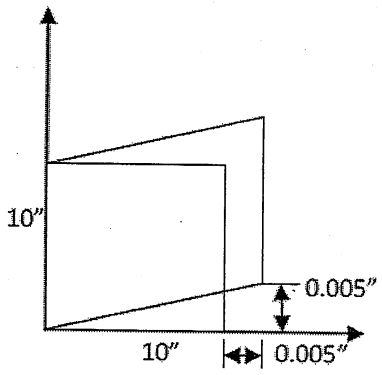

Fig. P3

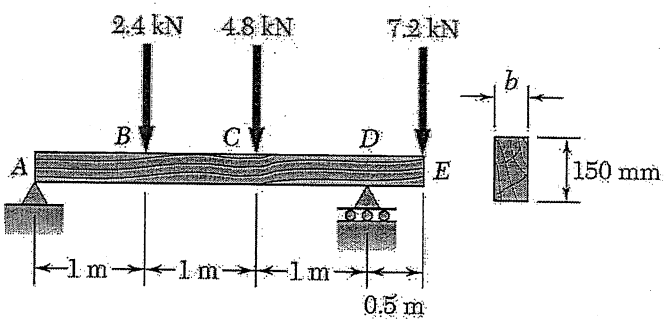

Fig. P4

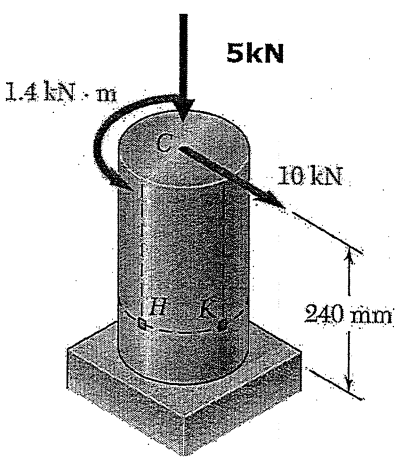

Fig. P5

PL/3

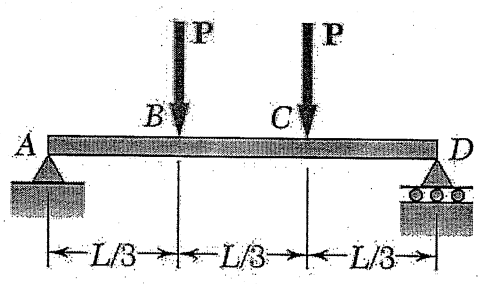

Fig. P6