淡江大學九十四學年度轉學生招生考試試題

系別： 航空太空工程學系三年級 科目：工程力學(含靜力學、材料力學)

准帶項目請打「∨」	
∨	簡單型計算機

節次： 7 月 /3 日第 5 節

本試題共 2 頁

P1.

1. An aircraft engine pylon is supported by a thrust link and a 1/2 in. bolt connection to a support fitting in the wing, as sketched in Fig. 1. If the bolt failed in shear, estimate the force that acted across the bolt. Take the maximum allowable shear strength in the bolt as 15,000 psi. *(20%)*
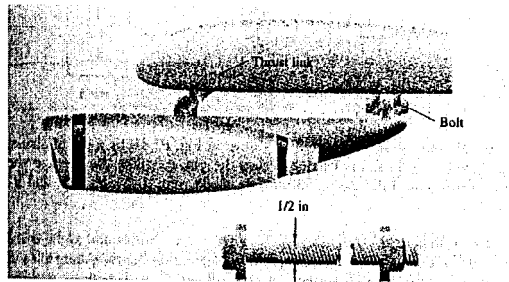

Fig. 1

2. Draw the shear stress and bending moment diagrams for the beam shown in Fig. 2. *(20%)*
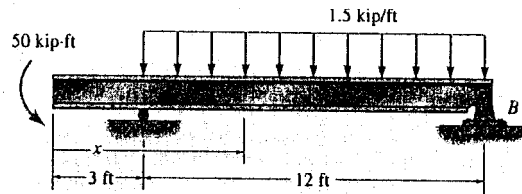

Fig. 2

3. When drilling a hole in a table leg, a furniture maker uses a hand-operated drill (see Fig. 3) with a bit of diameter $d = 5.0$ mm.

   (a) If the resisting torque supplied by the table leg is equal to 0.4 N·m, what is the maximum shear stress in the drill bit? *(10%)*

   (b) If the shear modulus of elasticity of the steel is $G = 75\,\text{GPa}$, what is the rate of twist of the drill bit (degrees per meter)? *(10%)*
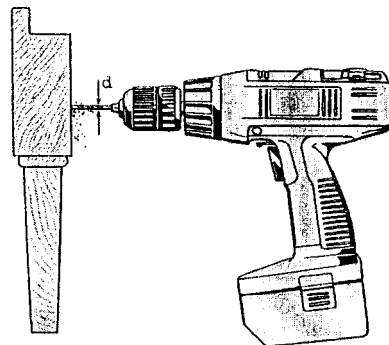

Fig. 3

請翻背面尚有試題

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4. Calculate the forces induced in members KL, CL, and CB by the 200 kN load on the cantilever truss, as shown in Fig. 4. (20%)
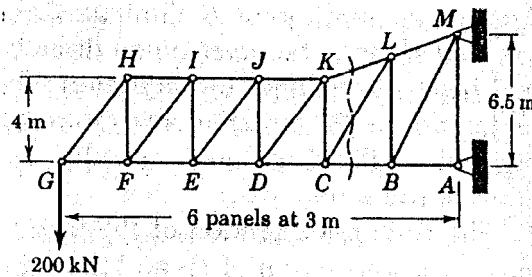

Fig. 4

5. A block placed under the head of the claw hammer (as shown in Fig. 5) greatly facilitates the extraction of the nail. If the 200 N pull on the handle is required to pull the nail, calculate the tension T in the nail. The contacting surfaces at A are sufficiently rough to prevent slipping. (20%)