淡江大學 96 學年度碩士班招生考試試題

系別：航空太空工程學系　　　　科目：材 料 力 學

本試題雙面印製

1. Determine the strain energy stored in a prismatic bar suspended from one end due to its own weight (see *Fig.* 1), assuming linearly elastic behavior. (20%)
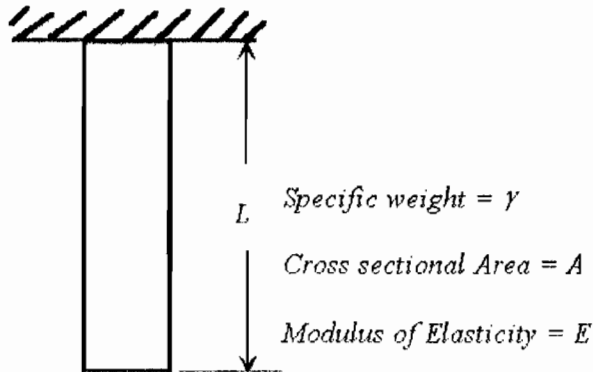

Specific weight = γ

Cross sectional Area = A

Modulus of Elasticity = E

Fig. 1

2. Two steel pipes are welded together to form a frame *ABC* as shown in *Fig* 2. Each pipe has outside diameter 240 *mm* and inside diameter 200 *mm*. Assuming $L=H=1.5m$ and $P=8$ *kN*, calculate the maximum tensile and compressive stress σ_t and σ_c, respectively, in the frame due to the load P. (20%)
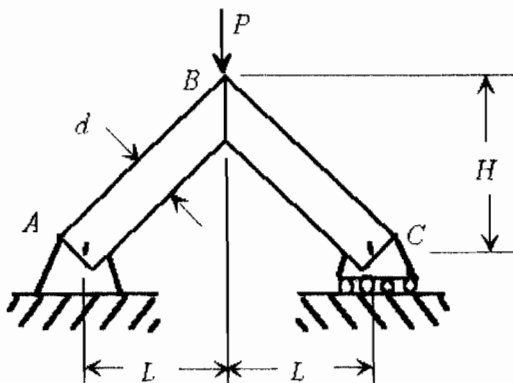

Fig. 2

3. What is the difference between "Statics" and the "Mechanics of Materials"? And what is the difference between "Dynamics" and the "Mechanics of Materials"? (20%)

◀ 注意背面尚有試題 ▶

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4. The cross section shown in *Fig.* 4 is subjected to a bending moment $M=40\ kN \cdot m$. Determine the normal stress at points A and B.   (20%)
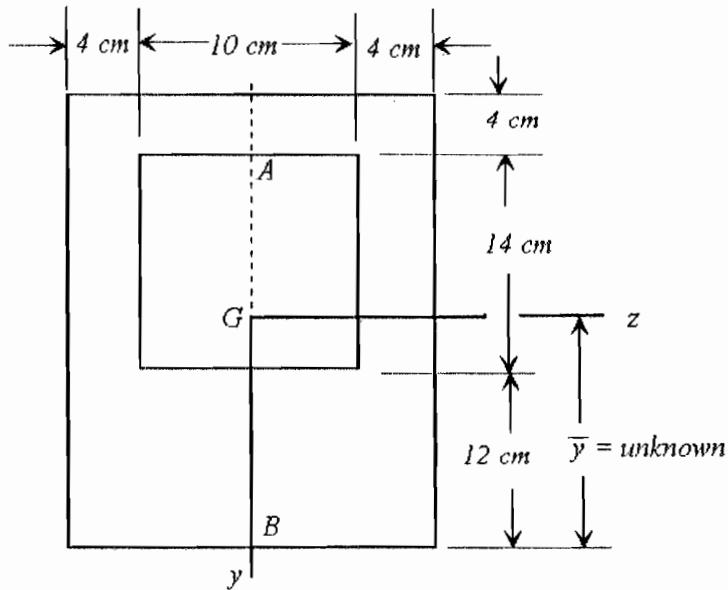

Fig. 4

5. A beam with rectangular cross section is subjected to a transverse force P as shown in *Fig.* 5. Write out the boundary condition of shear stress (τ) at the top and bottom surface ($y=\pm h/2$) of the beam, and give an explanation to your answer. (20%)
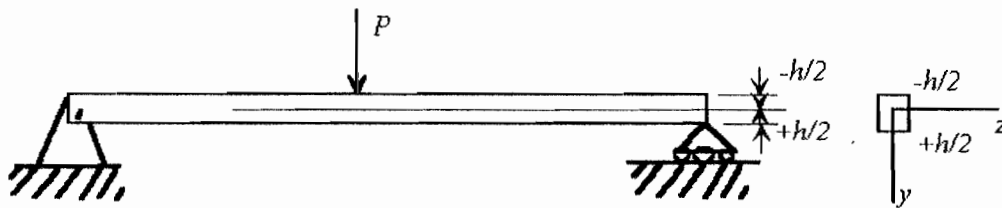

Fig. 5