淡江大學九十一學年度日間部轉學生招生考試試題

系別：航太工程學系三年級　　　科目：工程力學（含靜力學、材料力學）

准帶項目請打「○」否則打「×」
計 算 機
○

1. Determine the forces in members AB, HB, and CF of the pin jointed truss as shown in *Figure 1.* (20%)
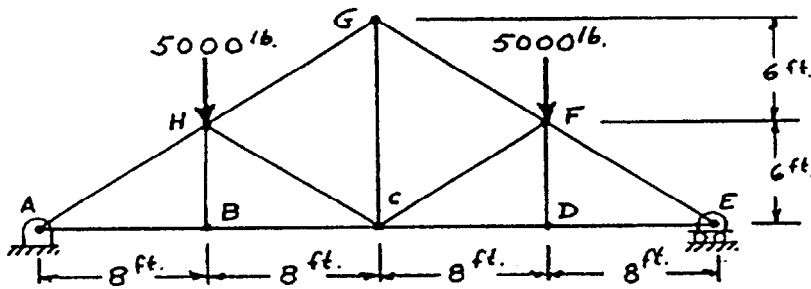

Figure 1.

2. Determine the x and y coordinates of the centroid of the T-section shown in *Figure 2.* **Then** determine the moments of inertia about the centroidal axes, I_x and I_y. (20%)
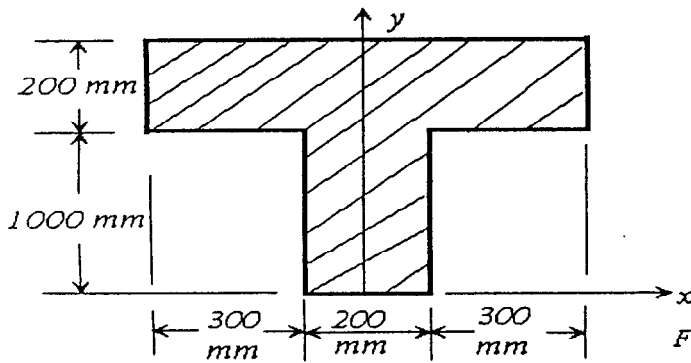

Figure 2.

3. A steel test specimen is tension tested and found to have the following properties:

(a) 20,000 *psi* at proportional limit, (b) 24,000 *psi* at 0.2 percent offset yield point.

Determine the total strain in the specimen when it is stressed to the yield point. (20%)

4. A solid circular steel shaft must carry a torque of 250 *foot-pounds* without twisting more than 4 *degrees per foot* of length. Determine the required dimensions for the shaft. (20%)

NOTE: $E = 30 \times 10^6 \, psi$; $\sigma_{max} = 30,000 \, psi$; $\mu = 0.25$; $G = 12 \times 10^6$ psi ;

$\tau_{max} = 10,000 \, psi$

◀ 注意背面尚有試題 ▶

系別：航太工程學系三年級　　　科目：工程力學（含靜力學、材料力學）

准帶項目請打「○」否則打「×」
計　算　機
O

本試題共　2　頁

5. One-dimensional stress-strain curves for different materials are shown below (*Figure 5.*), all drawn to the same scale. " x " indicates fracture. Determine :

(1) which one is the most ductile material, (4%)
(2) which one is the material having the highest ultimate stress, (4%)
(3) which one is the material exhibiting nonlinear elastic behavior, (4%)
(4) which one is the most brittle material, (4%) and
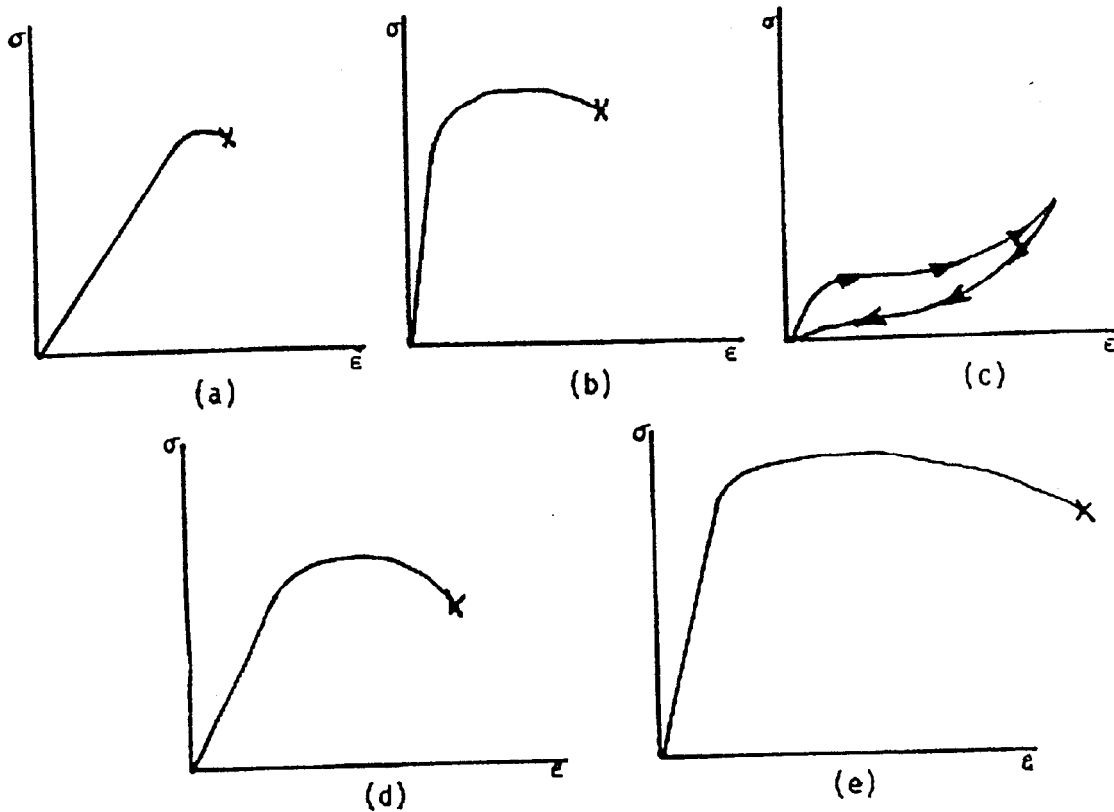(5) which one is the material with the highest stiffness (E). (4%)

Figure 5.