

淡江大學九十三年學年度轉學生招生考試試題 82-1

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「○」否則打「×」	
○	簡單型計算機

節次：7月14日第5節

本試題共 2 頁

本試題雙面印製

1. The following values of stress and strain are extracted from a test data recorded during a tension test in a mild steel specimen as shown in Table 1. The initial diameter of the material was 0.502 cm and the gage length was 8 cm. **Draw** the stress-strain curve **and** identify the proportional limit (5%), yield point(5%), ultimate strength(5%), and breaking stress for the material(5%).

Total applied load (N)	Stress N/cm^2	Strain cm/cm
1100	5500	0.000125
2570	12480	0.000375
4600	23200	0.000750
6600	33300	0.001125
7300	36850	0.001250
7600	38400	0.001375
7450	37600	0.001688
8100	40900	0.023500
9860	49800	0.037500
11850	59800	0.082500
12760	63900	0.182500
9840	49700	0.208750

Table 1

2. At the proportional limit, an eight-inch gage length of a 1/2-inch diameter bar has elongated 0.012 inch and the diameter has reduced 0.00025 inch. The total axial load was 4800 lb. Determine the following properties of this material: (a) modulus of elasticity(5%), (b) Poisson's ratio(5%), (c) proportional limit(5%), (d) modulus of rigidity(5%), and (e) what would be the factor of safety with respect to slip if a one-inch diameter bar of the same material was carrying the same load? (5%)

GO ON TO REVERSE SIDE →

◀ 注意背面尚有試題 ▶

淡江大學九十三年學年度轉學生招生考試試題 52-2

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「○」否則打「×」	
○	簡單型計算機

節次：7月14日第5節
本試題共 2 頁

3. A hollow shaft has an outside diameter of 150 mm and an inside diameter of 60 mm. The shaft is fixed at one end and is loaded by two applied torques as shown in Figure 3. Determine the maximum shear stress acting on the outside surface of the shaft. (10%)
Determine the maximum shear stress on the inside surface of the shaft. (10%)

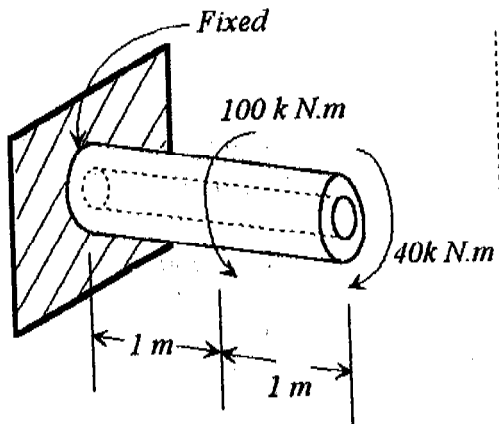


Figure 3

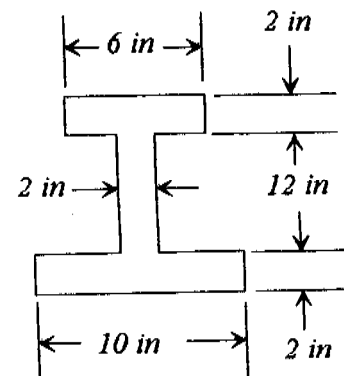
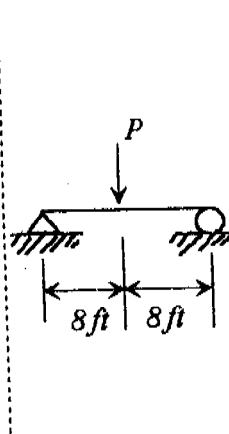


Figure 4

4. Determine the maximum load P that can be applied the beam shown in Figure 4 if the allowable bending fiber stresses are $15,000 \text{ lb/in}^2$ in tension and $25,000 \text{ lb/in}^2$ in compression. (20%)
5. Find the forces in the members BF , and CE of the truss shown in Figure 5. (15%)

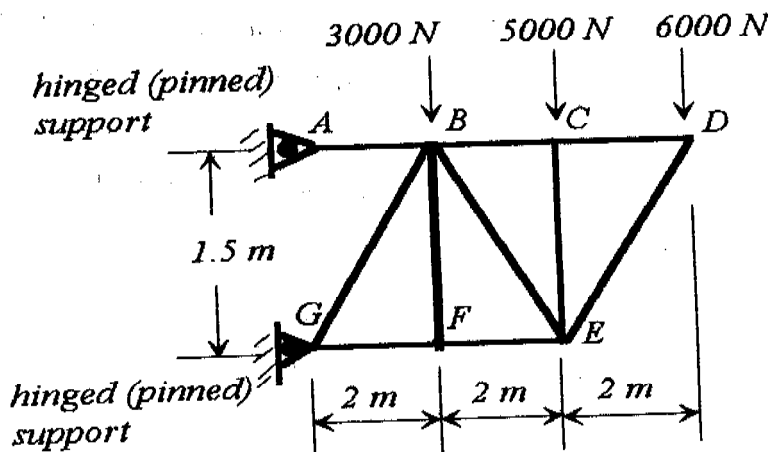


Figure 5