

國立嘉義大學 104 學年度
生物機電工程學系碩士班(甲組)招生考試試題

科目：材料力學（※禁止使用計算機）

1. A shaft of 3 m long transmits 20kW with 120rpm. Determine the minimum diameter of the shaft if the allowable shear stress and torque angle are 40MPa and 6° , respectively. (Assume $G=84\text{GPa}$) .(25%)

2. An element in plane stress is subjected to stresses as shown in Figure 1. Using Mohr's circle, determine
(a) the principal stresses and principal planes,
(b) the maximum shear stresses. (25%)

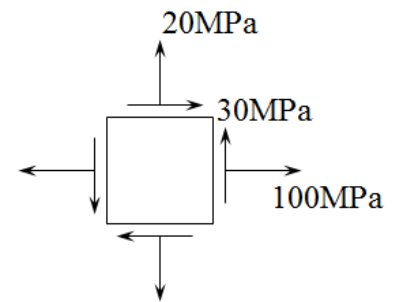


Figure 1.

3. Explanation of those terminologies. (25%)

- (a) Hooke's law
- (b) Ultimate stress
- (c) Saint Venant's principle
- (d) Yield point at 0.2 % offset
- (e) Statically indeterminate

4. Draw the shear-force and bending-moment diagrams for the beam shown by the area method. (25%)

