

國立成功大學

111學年度碩士班招生考試試題

編 號： 118

系 所： 工程科學系

科 目： 材料力學

日 期： 0220

節 次： 第 2 節

備 註： 可使用計算機

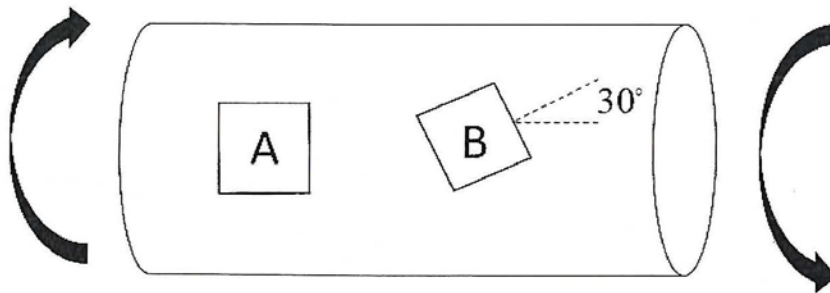
※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

材料力學共有五題，請詳細條列計算或誘導過程。請考生將每題的答案（若有單位請包含單位）以方框標註出來，以利批改考卷。

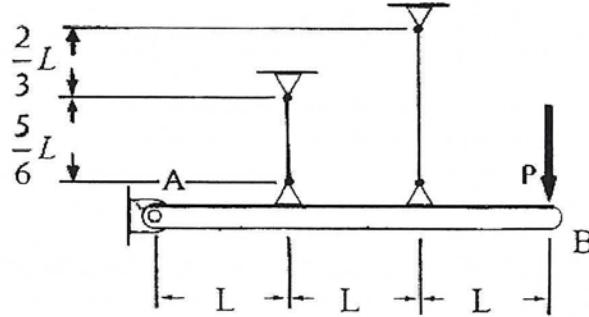
1. (15%)

- Describe the properties of brittle materials.
- Describe the properties of ductile materials.
- Explain the complete definition of Poisson's ratio.
- Explain the plane stress condition.
- Explain the complete definition of statically indeterminate problems.

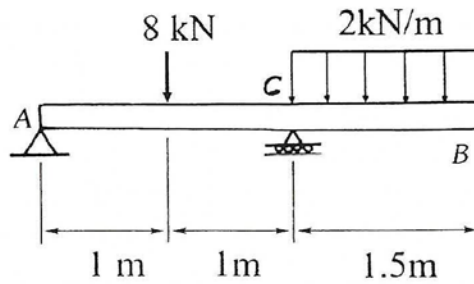
2. (15%) Consider two elements A and B located on the surface of a circular shaft. A torsion T is applied to the shaft, as shown in the figure. The element A is oriented at 0° relative to the shaft axis while the element B is oriented at 30° relative to the shaft axis. Please sketch and determine the stresses on each element. The diameter of the shaft is d .



3. (25%) A rigid bar AB is connected to two elastic wires having a diameter of d and a modulus of elasticity of E . If a load P is applied at B , determine the deflection at B .



4. (25%) For the beam and loading shown in the figure, draw the shear and bending-moment diagrams.



5. (20%) The couple M is applied to a beam, as shown in the figure. Determine the stress at B and D.

