

國立成功大學

115學年度碩士班招生考試試題

編 號： 112

系 所： 生物醫學工程學系

科 目： 工程力學

日 期： 0203

節 次： 第 2 節

注 意： 1. 可使用計算機
2. 請於答案卷(卡)作答，於
試題上作答，不予計分。

1. Define the following terms:

- (a) Rigid body. (2%)
- (b) Theorems of Pappus and Guldinus. (3%)
- (c) 1st moment of area and 2nd moment of area. (5%)
- (d) Mohr's Circle. (4%)

2. Given a truss shown in Fig. 1. (a) Indicate all **zero-force members** by inspection (6%); (b) determine the force in members **IC** and **CG** of the truss and state of these members (tension or compression). (12%)

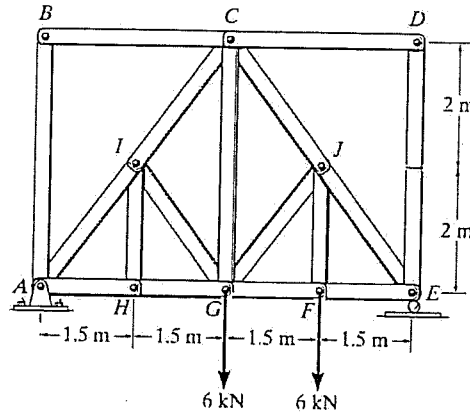


Fig. 1

3. A simply-supported beam is given (Fig. 2). (a) Draw the **shear and moment diagrams** of the beam (18%); (b) indicate where on the beam should be particularly protected? Give an example regarding your protection strategy (5%).

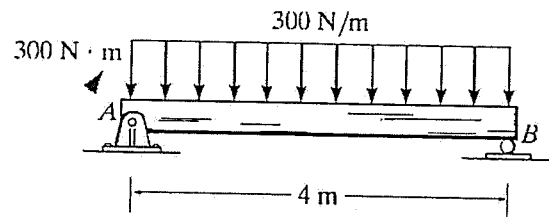


Fig. 2

4. A bar with a cross-sectional area like a triangle is imposed of loading on the top as shown in Fig. 3. (a) Determine the **angle of the principal axes** (about the centroid **C**) with I_{max} bear the loading. (10%) (b) Determine the **maximum and minimum moments of inertia for an area, I_{max} and I_{min}** . (12%) (Hint: Mohr's Circle)

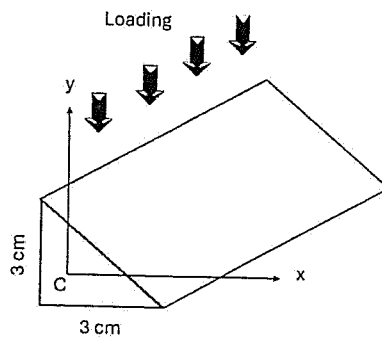


Fig. 3

5. The rectangular plate shown in Fig.4 weighs 75 N and is held in the position by hinges at A and B and by cable EF . (a) Draw a **free body diagram** for the rectangular plate. (5%) (b) Determine the tension in the cable EF , (6%) and (c) the reactions at A and B . (12%)

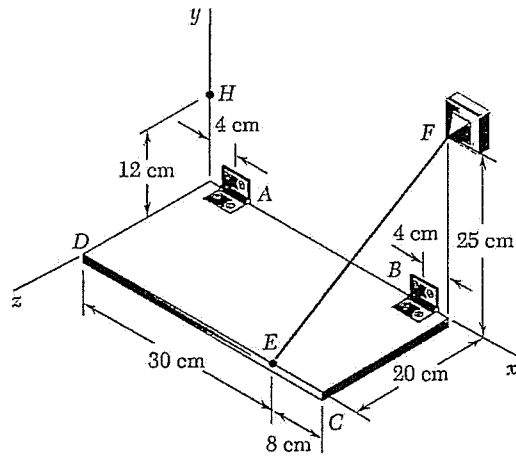


Fig. 4