

國立成功大學

113學年度碩士班招生考試試題

編 號：147

系 所：生物醫學工程學系

科 目：工程力學

日 期：0201

節 次：第 2 節

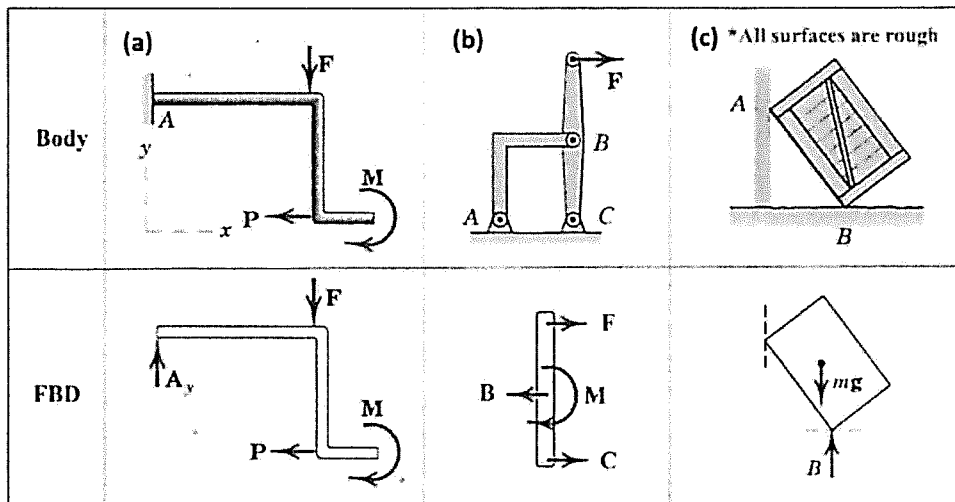
備 註：可使用計算機

※ 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。

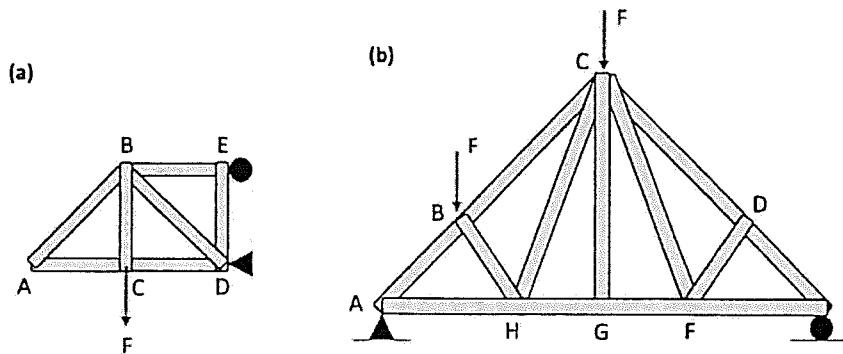
1. Explain the following terms: (12%)

- (a) Free body diagram
- (b) Mohr's Circle
- (c) Moment of inertia
- (d) zero force member

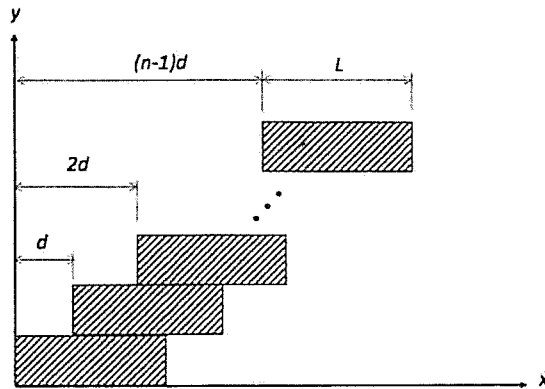
2. Complete the following free body diagrams by adding, removing, or correcting forces/moments. (12%)



3. Indicate all zero-force members. (10%) (Hint: no calculations needed!)



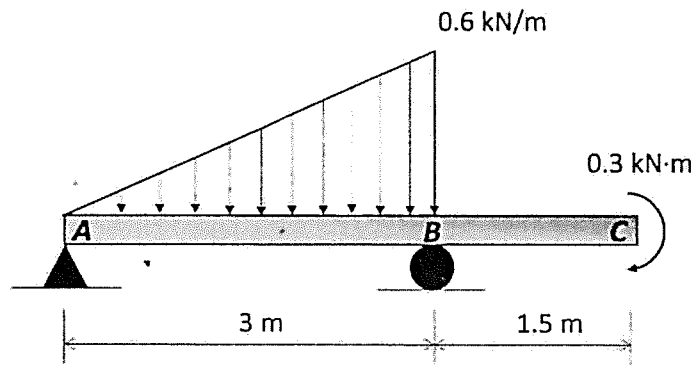
4. Uniform bricks having a length L and weight W are stacked one on top of the other, with each block overhanging the other by a distance d , as shown (Fig. 1). Show that the maximum number of bricks which can be stacked in this manner is $n < L/d$. (16%) (Hint: center of weight)



(Fig. 1)

5. A loaded beam (Fig. 2) is given. The weight of the beam is negligible.

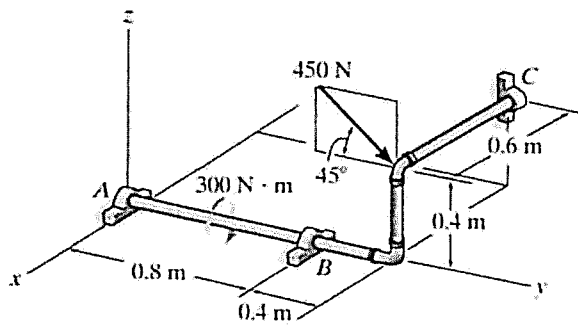
- (a) Determine the general expressions of the shear force V and the bending moment M . (10%)
- (b) Draw the shear and moment diagrams. (15%)



(Fig. 2)

6. A pipe system ABC is constrained and reaches its equilibrium (Fig. 3).

- (a) Draw a free body diagram for the system. (6%)
- (b) Indicate the total number of unknowns? (4%)
- (c) Determine the components of reaction acting at the smooth journal bearings A, B, and C (15%).



(Fig. 3)