

國立成功大學

113學年度碩士班招生考試試題

編 號：113

系 所：工程科學系

科 目：工程力學

日 期：0202

節 次：第 1 節

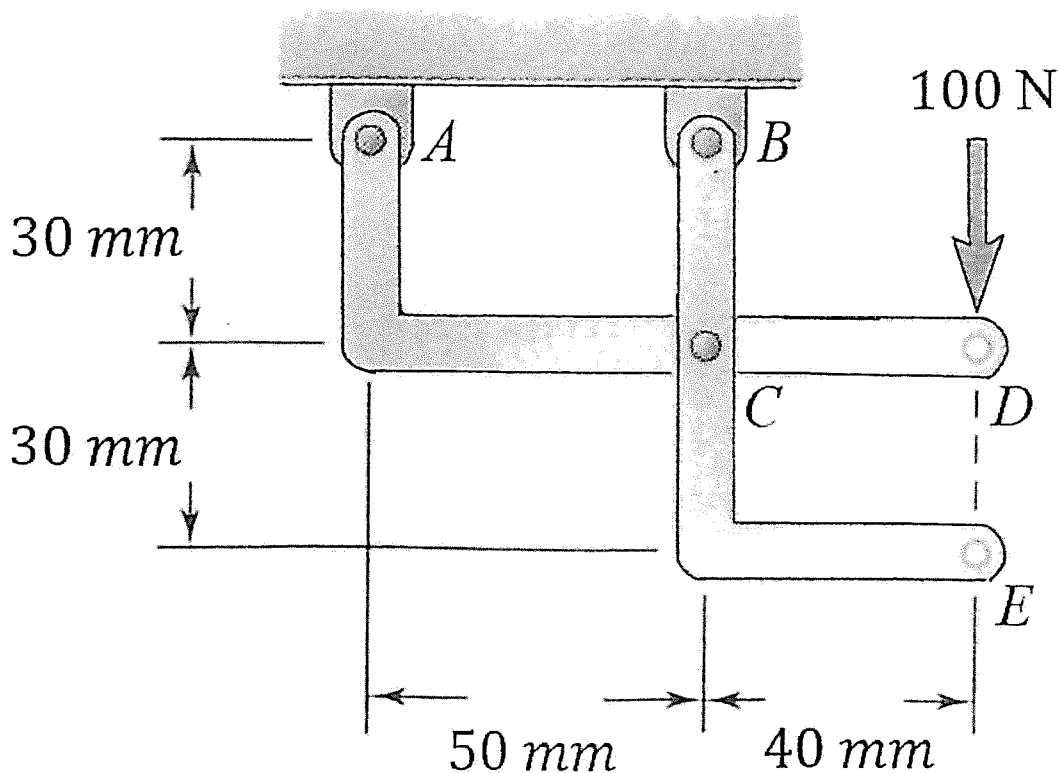
備 註：可使用計算機

※ 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。

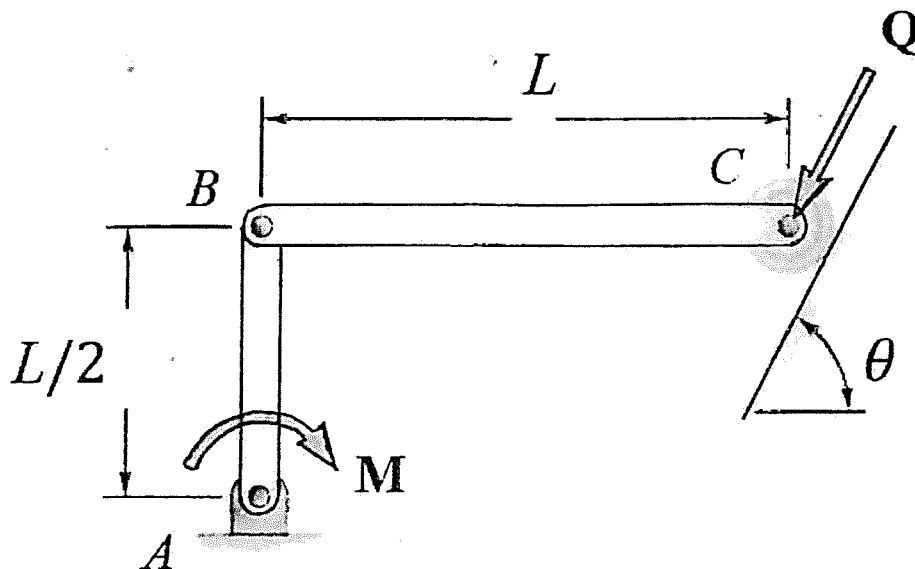
工程力學共有八題，請詳細條列計算或誘導過程。請考生將每題的答案（若有單位請包含單位）

以方框標註出來，以利批改考卷。

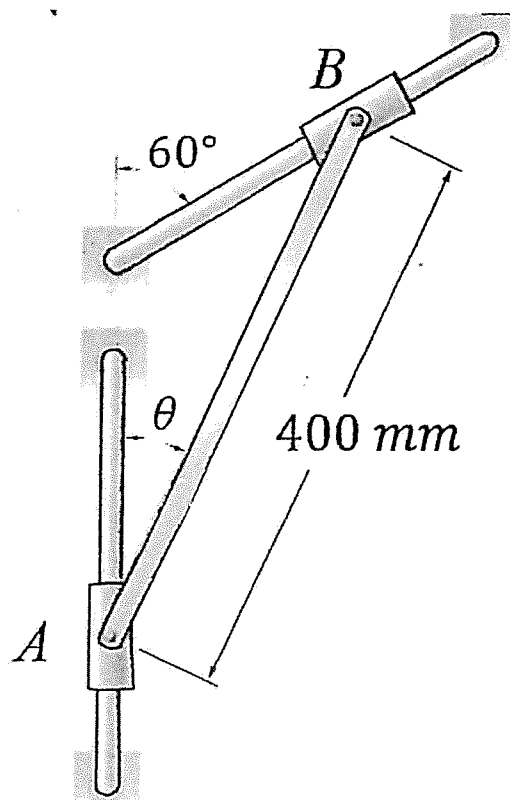
- (5%) A car, initially at rest, travels 20 m in 5 s along a straight line with constant acceleration. Determine the acceleration of the car.
- (5%) Determine the angle between $\vec{A} = (-20m)\vec{i} + (40m)\vec{j}$ and the positive x axis.
- (5%) A block slides down a frictionless plane that makes an angle of 25° with the horizontal. Determine the acceleration of the block.
- (5%) If wheel turning at a constant rate completes 100 revolutions in 8 s, determine its angular speed.
- (20%) Determine the components of the reactions at A and B if the 100 N load is applied (a) at D (b) at E .



6. (20%) For the linkage shown, determine the couple M required for equilibrium when $L = 2$ m, $Q = 50$ N, and $\theta = 60^\circ$.



7. (20%) Collar A moves upward with a constant velocity of 2 m/s. At the instant shown when $\theta = 20^\circ$, determine (a) the angular velocity of rod AB, (b) the velocity of collar B.



8. (20%) A uniform rectangular plate has a mass of 4 kg and is held in position by three ropes as shown. Knowing that $\theta = 20^\circ$, determine, immediately after rope CF has been cut, (a) the acceleration of the plate, (b) the tension in ropes AD and BE .

