

國立臺北科技大學 109 學年度碩士班招生考試

系所組別：1120 機械工程系機電整合碩士班乙組

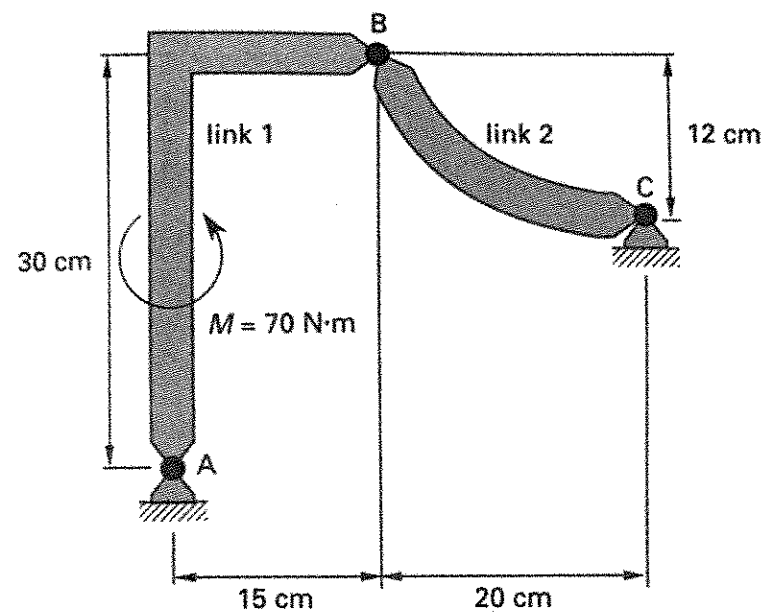
第二節 工程力學 試題

第 1 頁 共 2 頁

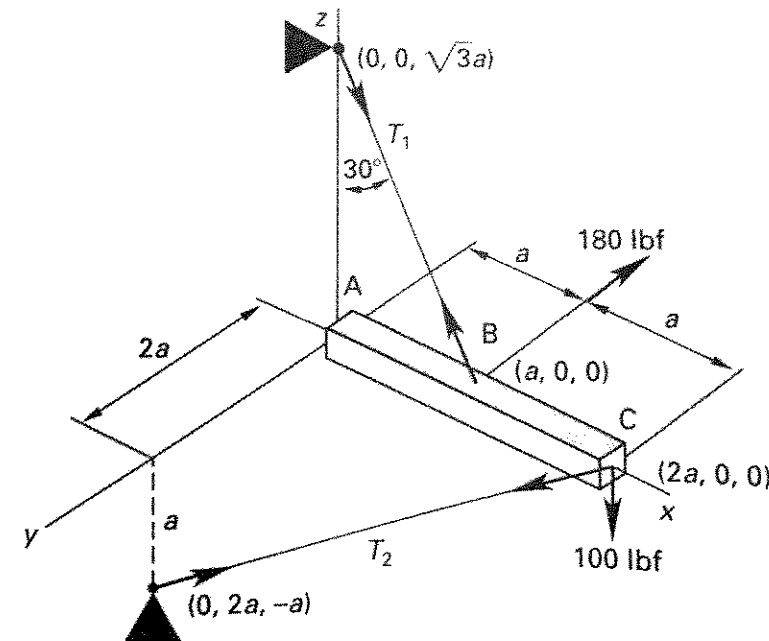
注意事項：

1. 本試題共五題，每題 20 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

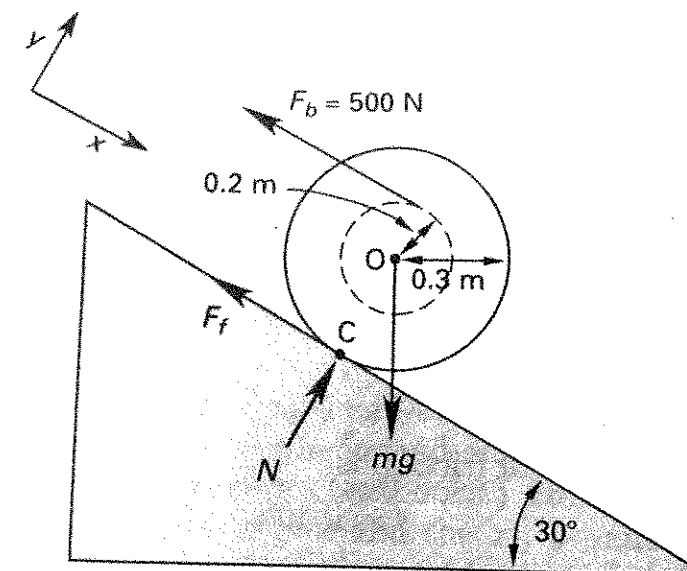
1. A $70 \text{ N}\cdot\text{m}$ couple is applied to the mechanism shown. All connections are frictionless hinges. What are the x - and y -components of the reactions at B? (x : horizontal; y : vertical) (20 分)



2. Beam AC is supported at point A by a frictionless ball joint and at points B and C by cables. A 100 lbf load is applied vertically to point C, and a 180 lbf load is applied horizontally to point B. What are the cable tensions T_1 and T_2 ? (20 分)

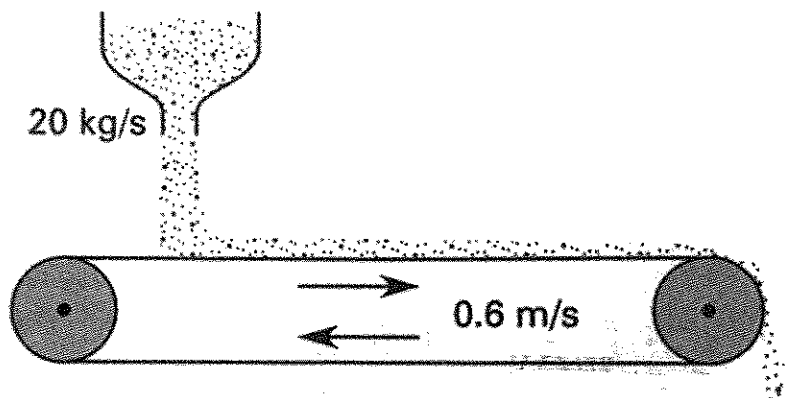


3. A 150 kg cylinder with radius 0.3 m is pulled up a plane inclined at 30° as fast as possible without the cylinder slipping. The coefficient of friction is 0.236. There is a groove in the cylinder at radius = 0.2 m. A rope in the groove applies a force of 500 N up the ramp. What is the linear acceleration of the cylinder? (20 分)



注意：背面尚有試題

4. 20 kg of sand fall continuously each second on a conveyor belt moving horizontally at 0.6 m/s. What power is required to keep the belt moving? (20 分)



5. The slender rod of length L and mass m is released from rest when $\theta = 0^\circ$. Using free-body and kinetic diagrams of the rod, formulate appropriate equations of motion and, determine, as a function of θ , the normal and frictional forces which are exerted on the ledge at A as it falls downward. (20 分)

