編號： 137

國立成功大學 105 學年度碩士班招生考試試題

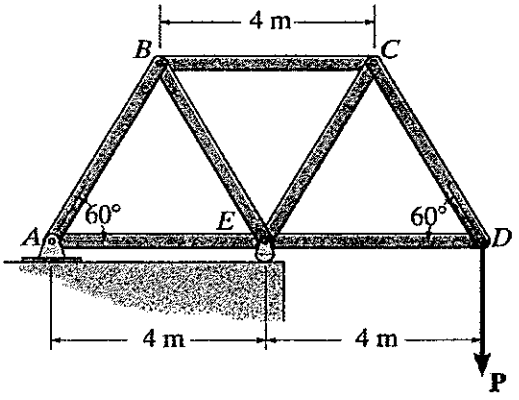
系　　所：航空太空工程學系

考試科目：工程力學

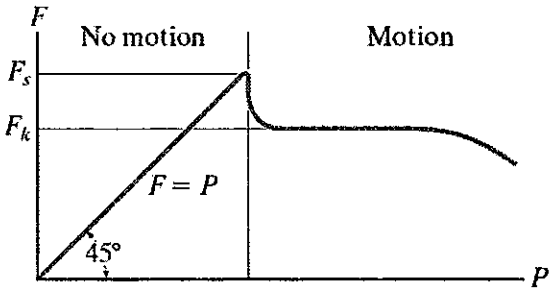
考試日期：0227，節次：2

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

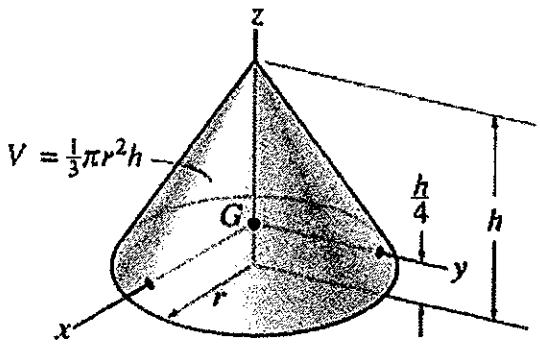
1. (15%) If the maximum force that any member in the truss shown can support is 8 kN in tension and 6 kN in compression, determine the maximum force *P* that can be supported at joint D



2. (15%) A block rests on a rough horizontal surface and is subjected to a horizontal force *P*. If the frictional force *F* along the contact surface can be described by the curve shown below, please **summarize** and **explain** the feature effects regarding friction observed in the plot.



3. (20%) Derive the **mass moment of inertia** about the *z* axis for the solid cone of total mass *m* as shown. Express your result in the form: $I_{zz} = Cmr^2$, where *C* is a constant to be determined.



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4. 解釋名詞 (15%)

(a).質量　(b).慣性　(c).慣性定律　(d).慣性座標系　(e).慣性力

5. Please derive the acceleration vector in polar coordinates(r-θ). (10%)

6. What is Coriolis acceleration? Please derive it. (10%)

7. When the uniform rigid bar is horizontal, the spring at C is compressed 3 in. If the bar weighs 50 lb, what is the force at B when support A is removed suddenly? The spring constant is 50 lb/in. (15%)