# 銘傳大學 98 學年度研究所碩士班招生考試

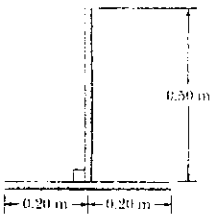
## 管理研究所碩士班（甲組）

## 第三節

## 普通物理學試題

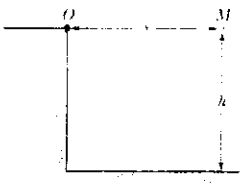
（第 1 頁共 1 頁）（限用答案本作答）　☑可使用計算機 ☐不可使用計算機

(15%) 1. Two thin rods (each of mass 0.2 kg) are joined together to form a rigid body as shown in the figure. One of the rods is 0.4 m long and the other is 0.5 m long. What is the rotational inertia of this rigid body about an axis that is perpendicular to the plane of the paper and passes through the center of the longer rod?



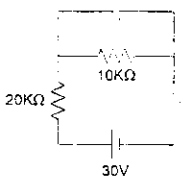

(15%) 2. Consider a satellite in a circular orbit about Earth. State how the following properties of the satellite depend on the radius $r$ of its orbit: (a) period, (b) kinetic energy, (c) angular momentum, and (d) speed.

(15%) 3. A particle of mass $M$ is dropped from a point that is at height $h$ above the ground and horizontal distance $s$ from an observation point O, as shown in the figure. What is the magnitude of the angular momentum of the particle with respect with point O when the particle has fallen half the distance to the ground?




(20%) 4. The electric field in the $xy$ plane produced by a positively charged particle is $7.2(-4i+3j)$ N/C at the point (3.0,3.0) cm and $-100i$ N/C at the point (4.0,0) cm. What are (a) the $x$ and $y$ coordinates and (b) the charge of the particle?

(15%) 5. The capacitor is uncharged when the switch is closed. What is the initial current through (a) 10 kΩ resistor and (b) the 20 kΩ resistor? (c) What is the current through the 10 kΩ resistor a very long time after the switch is closed?




(20%) 6. With a velocity of 12 m/s, a block of mass 0.2 kg starts up a plane inclined 30° with the horizontal. (a) If the coefficient of sliding friction is 0.16, determine how far up the plane the block travels before stopping. (b) What is the block's speed when the block returns to the bottom of the plane? (c) What is the least value for the coefficient of static friction so that the body, once stopped, will not come back down?

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