**臺北巿立教育大學**

**九十九學年度研究所碩士班入學考試試題**

**所 別：**自然科學系碩士班(科學組物理科)

不得使用計算機或任何儀具。

**科 目：**普通物理

**考試時間：**90分鐘【08:20 − 09:50】

**總 分：**100分

* **注意：**不必抄題，作答時請將試題題號及答案依照順序寫在答卷上；**限用藍色或黑色筆作答**，使用其他顏色或鉛筆作答者，所考科目以零分計算。**(於本試題紙上作答者，不予計分。)**
1. To describe the feature near the triple point of water. (15％)
2. To describe the Relativity Theory of Einstein. (15％)
3. The ballistic pendulum was used to measure the speeds of bullets. The large block of wood of mass M=6.5 Kg, hanging from two long cords. A bullet of mass m=10.2g is fired into the block, coming quickly to rest. Their center of mass rising a vertical distance h=7cm before the pendulum comes momentarily to rest at the end of its arc. What is the speed of the bullet just before the collision? (20％)
4. A ball of mass M1 is fastened to a cord with length L. The ball is then released and at the end of its path it strikes a block of mass M2. The block is initially at rest on a frictionless table. The collision is elastic. Find (a) the speed of the ball v and (b) the speed of the block u, both just after the collision. (20％)

Fig. 1

1. A boy is initially seated on the top of a hemispherical ice mound of radius R. He begins to slide down the ice with a negligible initial speed. Approximate the ice as being frictionless. At what height does the boy lose contact with the ice?

(15％)

1. Fig. 2 shows spherical shell with uniform charge density ρ. The inner and outer radius of the shell is a and b, respectively. Find the electric field at (a) r < a,

(b) a < r < b, and (c) r > b. (15％)

 Fig. 2