---

※ 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. Assume that $E = mv^2/2$ for a particle moving in a straight line. Show that $\Delta E \Delta t \geq h/4\pi$, where $\Delta t = \Delta x/v$. (25%)

2. Find the energies of the two photons that are produced when annihilation occurs between an electron and positron that are initially at rest. (25%)

3. A flashbulb is situated 60 km from an observer. The bulb is fired and the observer sees the flash at 2:00P.M. What is the actual time that the flashbulb is fired. (25%)

4. Assume an observer, $O$, determines that two events are separated by $3.6 \times 10^8$ m and occur 2 s apart. There exists a second observer, $O'$, moving relative to the first observer who will determine that the two events occur at the same spatial location. What is the time interval between the two events measured by this observer? (25%)