

國立中央大學八十五學年度碩士班研究生入學試題卷

所別：太空科學研究所 不分組 科目：近代物理 共 1 頁 第 1 頁

1. A particle of rest mass m_0 has a speed $v=0.8c$. In terms of m_0 and c , what is the total energy, kinetic energy and momentum of this particle? (20%)
2. Compton-scattered photons of wavelength λ are observed at 90° . In terms of λ , what is the scattered wavelength observed at 180° ? (20%)
3. In Bohr's model of atom, the wavelength of the transition from $n_1 = 4$ to $n_2 = 2$ is λ . In terms of λ , what is the wavelength of the transition from $n_1 = 5$ to $n_2 = 2$? (20%)
4. Sketch the wave function of a particle of energy E encountering a step of height V , for the cases: (a) $E > V$ and (b) $E < V$. (20%)
5. Explain (a) normal Zeeman effect. (b) periodic table. (20%)