國立中央大學97學年度碩士班考試入學試題卷

所別：遙測科技碩士學位學程碩士班　科目：普通物理　共 1 頁 第 1 頁

＊請在試卷答案卷（卡）內作答

1. State the following terminologies (20%)
   (a) Keper's Laws
   (b) Pascal's Principle
   (c) Bernoulli's Equation
   (d) The Second Law of Thermodynamics
   (e) Maxwell's Equations

2. A crate whose mass is 15 kg is pulled a distance d (=6 m) up a frictionless ramp, to a height h of 2 m above its starting point. (a) What force F must be exerted along the ramp? (b) How much work is done by the force F? (20%)

3. A rocket whose initial mass Mi is 800 kg ejects mass during a burn at the rate R=2.0 kg/s. The speed u of the exhaust gases relative to nozzle of the rocket engine is 2.5 km/s. (a) What is the initial acceleration of the rocket? (b) The mass Mf of the rocket when its fuel is exhausted is 295 kg. What is its speed at that time? (20%)

4. If you are driving a convertible toward a police car at 50 m/s and sounding stereo system with frequency v of 1000 Hz. The police car, parking by the roadside, is equipped by a radar/speed gun with frequency f of 1.2 GHz. Sound speed: 350 m/s and light speed: 3x10**8 m/s. (a) What frequencies v' and f' will be heard and observed by the police? (b) Will you apply the same formula to derive the frequencies v' and f'? Why? (20%)

5. Suppose that you were helping to design a satellite which is to circularly orbit 230 km above the earth's surface. Calculate the period and speed of the satellite. (20%)