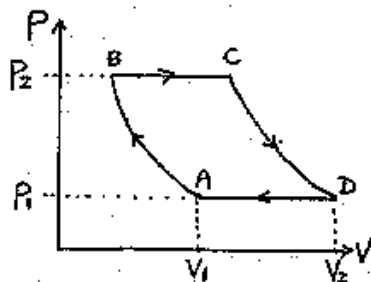


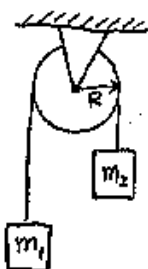
# 立中央大學八十九學年度碩士班研究生入學試題卷

別: 地球物理研究所 不分組 科目: 普通物理學 共 1 頁 第 1 頁  
應用地質研究所

- (20分) 1. A stiff wire, bent into a semi-circle of radius  $a$ , is rotated with frequency  $f$  in a uniform magnetic field  $B$ . The magnetic field is perpendicular to the rotation axis. What are the frequency and the amplitude of the varying  $emf$  induced in the loop?
- (20分) 2. A point charge  $Q$  is located just above the center of the flat face of a hemisphere of radius  $R$ . What are the electric fluxes through the curved surface and through the flat face, respectively?
- (20分) 3. An ideal gas is carried through a thermodynamic cycle consisting of two isobaric and two isothermal processes as shown in the following figure. What is the net work done in the entire cycle? (in terms of  $P_1, P_2, V_1, V_2$ )



- (20分) 4. Consider two masses connected by a string that passes over a pulley having a moment of inertia of  $I$  about its axis of rotation, as shown in the following figure. The string does not slip on the pulley, and the system is released from rest. What are the linear speeds of  $m_1$  and  $m_2$  after  $m_2$  descends through a distance of  $h$ ? And, what is the angular speed of the pulley at this moment?



- (20分) 5. A sound wave of 20cm wavelength enters the tube at point A in the following figure. What must be the smallest radius  $r$  such that a minimum sound will be heard at point B?



參考用