系所別：太空科學研究所　科目：流體力學

1. Explain the following terms. (20%)
   (a) Bernoulli's theorem.
   (b) Vorticity and circulation.
   (c) Reynolds number.
   (d) Stagnation point.
   (e) Joukowski theorem.

2. (a) From conservation of mass to derive the continuity equation. (in Eulerian description) (13%)
   (b) What is the condition of the incompressible flow. (in mathematical form) (7%)

3. Using the scale analysis to derive the two-dimensional Prandtl boundary layer equations. (20%)

4. Derive the Navier-Stokes equation for a Newtonian viscous fluid. (20%)

5. Suppose that a semi-infinite region of stationary Newtonian viscous fluid is bounded by a rigid plane (at y=0, say) which is suddenly given a velocity V_0 in its own plane and thereafter maintained at that speed. Derive the velocity distribution $V(y, t)$. (20%)