

淡江大學 98 學年度轉學生招生考試試題

系別：航空太空工程學系三年級

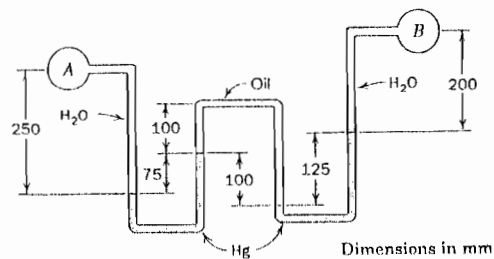
科目：流體力學

准帶項目請打「V」	
✓	計算機

本試題共 8 大題， 1 頁

- 一、何謂流體靜力學(Fluid Statics)? 任舉一例屬於流體靜力學所探討範圍。何謂流體動力學(Fluid Dynamics)? 任舉一例屬於流體動力學所探討範圍。(10%)
- 二、何謂 shear stress? 何謂 normal stress? 何謂 boundary layer? (10%)
- 三、推導 continuity equation, momentum equations 及 energy equation 時, 分別所根據之物理定律為何? (10%)
- 四、什麼是摩擦阻力(friction drag)? 什麼是壓力阻力(pressure drag)? (10%)
- 五、dimensional analysis 之主要目的為何? 何謂 incomplete similarity? (10%)
- 六、Which of the following sets of equations represent possible two-dimensional incompressible flow cases? (註:利用 $\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y}$ 是否為零來判斷) (15%)

(a) $u=2xy-x^2+y, v=2xy-y^2+x^2$; (b) $u=xt+2y, v=xt^2-yt$; (c) $u=(x+2y)xt, v=(2x-y)yt$
- 七、Water flows through pipes A and B. Oil, with specific gravity 0.8, is in the upper portion of the inverted U. Mercury (specific gravity 13.6) is in the bottom of the manometer bends. Determine the pressure difference, $P_A - P_B$, in units of kilopascals. (15%)



- 八、The drag force, F , on a smooth sphere depends on the relative velocity, V , the sphere diameter, D , the fluid density, ρ , and the fluid viscosity, μ . Obtain a set of dimensionless groups that can be used to correlate experimental data. (20%)