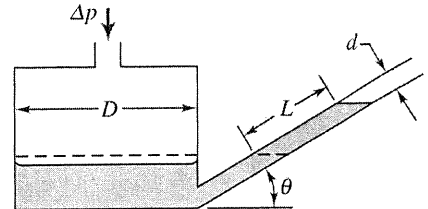


逢甲大學101學年度碩士班招生考試試題 編號：015 科目代碼：

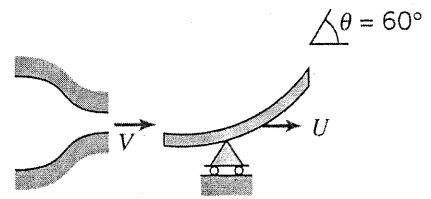
科目	流體力學	適用系所	航太與系統工程學系熱流組	時間	100 分鐘
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※請務必在答案卷作答區內作答。

1. An inclined-tube reservoir manometer is constructed as shown. Derive a general expression for the liquid deflection, L , in the inclined tube, due to the applied pressure difference, Δp . Also obtain an expression for the manometer sensitivity. (30%)



2. A light plane flies at 150 km/hr in standard air at an altitude of 1000 m. Determine the stagnation pressure at the leading edge of the wing. At a certain point close to the wing, the air speed relative to the wing is 60 m/s. Calculate the pressure at this point. (30%)
3. The sketch shows a vane with a turning angle of 60° . The vane moves at constant speed, $U = 10 \text{ m/s}$, and receives a jet of water that leaves a stationary nozzle with speed $V = 30 \text{ m/s}$. The nozzle has an exit area of 0.003 m^2 . Determine the force components that act on the vane. (20%)



4. Consider the steady laminar flow of a thin sheet of viscous liquid with a free surface as shown in the Figure.

- a. Show that the velocity distribution in this flow is given by the following formula:

$$u = \frac{\gamma}{\mu} y \left(h - \frac{y}{2} \right) \sin \theta$$

- b. Calculate the flow rate per unit width (perpendicular to the plane of paper). (20%)

