淡江大學99學年度轉學生招生考試試題

系別：水資源及環境工程學系三年級　科目：流　體　力　學

本試題共 5 大題，2 頁

本試題雙面印刷

①

20%

2.70 An open tank has a vertical partition and on one side contains gasoline with a density $\rho = 700$ kg/m³ at a depth of 4 m, as shown in Fig. P2.70. A rectangular gate that is 4 m high and 2 m wide and hinged at one end is located in the partition. Water is slowly added to the empty side of the tank. At what depth, h, will the gate start to open?
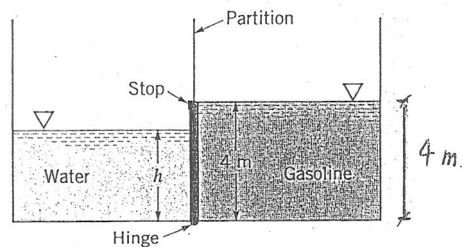
■ **F I G U R E   P2.70**

②

20%

3.68 Water flows steadily from the large open tank shown in Fig. P3.68. If viscous effects are negligible, determine **(a)** the flowrate, Q, and **(b)** the manometer reading, h.
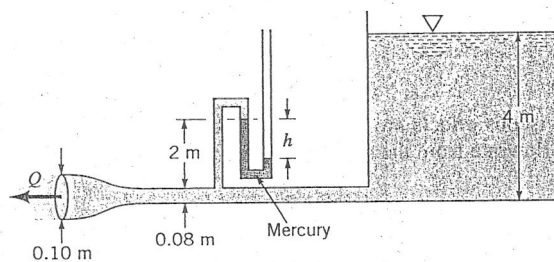
■ **F I G U R E   P3.68**

Specific gravity of Mercury = 13.6

背面尚有試題

(3)

20%

5.52 Water flows from a large tank into a dish as shown in Fig. P5.52. **(a)** If at the instant shown the tank and the water in it weigh W_1 N, what is the tension, T_1, in the cable supporting the tank? **(b)** If at the instant shown the dish and the water in it weigh W_2 N, what is the force, F_2, needed to support the dish?
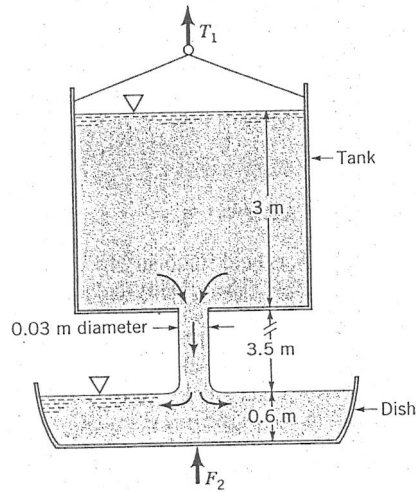

■ FIGURE P5.52

(4)

20%

6.38 The velocity potential for a certain inviscid flow field is

$$\phi = -(9.8x^2y - 3.28y^3)$$

where ϕ has the units of m²/s when x and y are in meters. Determine the pressure difference (in kPa) between the points (0.3, 0.6) and (1.2, 1.2), where the coordinates are in meters, if the fluid is water and elevation changes are negligible.

(5)

20%

7.15 Assume that the flowrate, Q, of a gas from a smokestack is a function of the density of the ambient air, ρ_a, the density of the gas, ρ_g, within the stack, the acceleration of gravity, g, and the height and diameter of the stack, h and d, respectively. Use ρ_a, d, and g as repeating variables to develop a set of pi terms that could be used to describe this problem.