KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

31 MAY 2019

Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : CIEG 204
Semester: I
F.M. : 40

SECTION "B"

*Attempt **ALL** questions.*
Make suitable assumptions wherever needed. The figures in the parenthesis indicate the marks allocated for the question.

1. A rectangular channel 1.5 m wide has a discharge of 0.2 m^3/s, which is measured by a right-angled V-notch weir. Find the position of the apex of the notch from the bed of the channel if the maximum depth of water is not to exceed 1m. Assume Cd = 0.62 [3]

2. What is velocity of approach? What are its applications? [2+1]

3. The angle of a reducing bend is 60° (that is deviation from initial direction to final direction). Its initial diameter is 300mm and final diameter is 150 mm and is fitted in a pipeline, carrying a discharge of 360 liters/sec. The pressure at the commencement of the bend is 294.3 kN/m^2. The friction loss in the pipe bend may be assumed as 10 percent of kinetic energy at exit of the bend. Determine the force exerted by the reducing bend. [5]

4. What is the Principle of dimensional homogeneity? Differentiate between Rayleigh's method and Buckingham Π- theorem method. [1+4]

5. A horizontal Venturimeter with inlet diameter 200mm and throat diameter 100mm is employed to measure the flow of water. The reading of the differential manometer connected to the inlet is 180mm of mercury. If the coefficient of discharge is 0.98, determine the rate of flow. [1+2]

6. The water is flowing through a tapering pipe having diameters 300mm and 150mm at section 1 and 2 respectively. The discharge through the pipe is 40 liters/sec. The section 1 is 10m above datum and section 2 is 6m above datum. Find the intensity of pressure at section 2 if that at section 1 is 400kN/m^2. [4]

7. Write short notes on: [3 × 3 = 9]
   a. Manometer b. Sluice gate c. Losses of energy in pipes

8. **Figure 1** shows an inverted differential manometer having an oil of specific gravity 0.8 connected to two different pipes carrying water under pressure. Determine the pressure in the pipe B. The pressure in pipe A is 2m of water. [3]

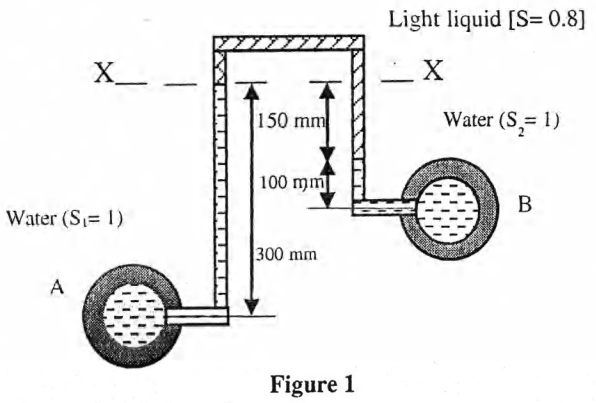

Figure 1

9. **Figure 2** shows a tank containing water and liquid (specific gravity = 0.9) up to height 0.25m and 0.5m respectively. The plan dimension of tank is 1.5m × 1.5m. Calculate [3+2]

i. Total pressure on the side of tank
ii. The position of center of pressure from one side of tank which is 1.5m wide

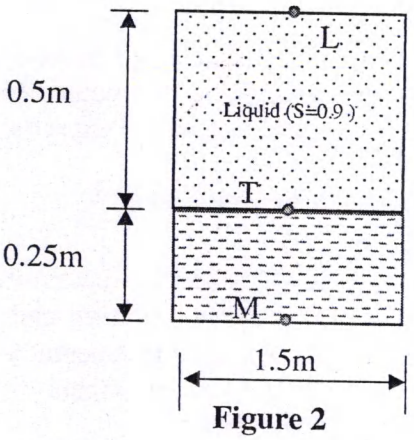

Figure 2