Mansoura University

Agric. Eng. Dept.
3rd level (external students)
Final Exam. 2014/*2015*
Hydraulics of Modern Irrigation Networks
2nd Semester
Total Marks: 80

Agric. Eng. Program
Irrigation and Drainage Engineering Division
Code No. Eng 335
Exam Date: 7/6/2015
Time allowed: Two hours

Faculty of Agriculture

This exam consists of one page
Answer all of the following questions

Question (1): *(25-Marks)*

A) In which locations the hydraulic jump may occur? *(10-Marks)*

B) Find the most economical cross section of a rectangular channel to carry 0.3 m³/s of water, when bed slope is 1 in 1000. Assume Chezy's C=60 *(15-Marks)*

Question (2): *(25-Marks)*

A) Prove that the loss of head due to sudden contraction is given by $h_c = 0.375 \frac{V_2^2}{2g}$ where: Co-efficient of contraction = 0.62 *(10-Marks)*

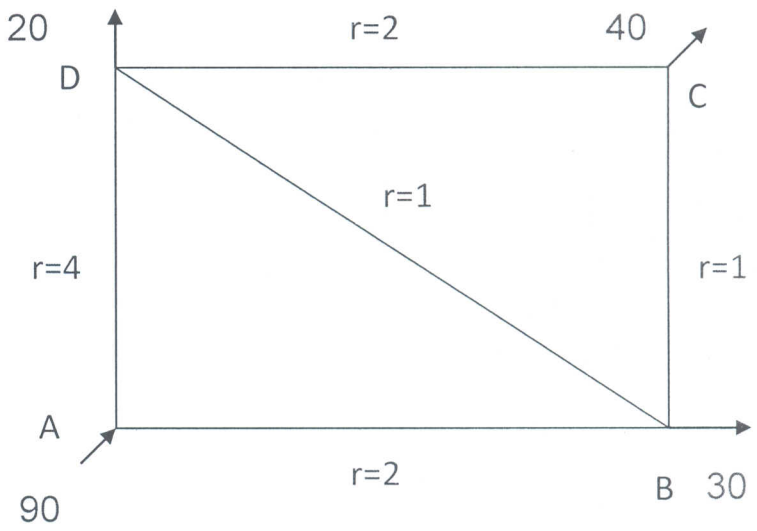
B) A 150 mm diameter pipe reduces in diameter abruptly to 100 mm diameter. If the pipe carries water at 30 L/s. calculate the pressure loss across the contraction. Take the co-efficient of contraction as 0.6. *(15-Marks)*

Question (3): *(30-Marks)*

A) Determine the difference in the elevations between the water surface in the two tanks which are connected by a horizontal pipe of diameter 0.3 m and length 400 m. The rate of flow of water through the pipe is 0.3 m³ /s. Consider all losses and take the value of f=0.008. *(15-Marks)*

Question (4): *(15-Marks)*

Calculate the discharge in each pipe of the network shown in the figure. The pipe network consists of 5 pipes. The head loss h_f in a pipe is given by $h_f = rQ^2$. The values of r for various pipes and also the inflow or out flow at nodes are shown in the figure.



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With my best wishes

Prof. Dr. Mahmoud Hany Ramadan
Dr. Mohamed Maher Ibrahim