

CE376 HYDROMECHANICS
HOMEWORK-VI
DUE DATE: 21.05.2020

- Q1) Consider a **rectangular channel** with a variable width b and horizontal channel bottom,
- Obtain the equation of water surface profile (dy/dx) as function of Froude number and channel width change (db/dx) in a channel transition assuming that over a short distance Δx , the energy losses can be neglected.
 - Using the equation you have obtained, draw the water surface profile if flow is subcritical and if there is an enlargement in channel cross section Δb in downstream section (2) and show your results on the graph of specific energy curve (E versus y curve).
- Q2) In a **trapezoidal channel** with a constant width of $b=3$ m. and side slopes of 1:3 (1 vertical, 3 horizontal) and discharge rate of $6 \text{ m}^3/\text{sec}$, if the maximum step upward height is $\Delta z=0.5$ m. not to cause any choking, what is the water depth before and after this maximum step upward. Draw the water surface profile and specific energy curve (E vs y) for this flow.
- Q3) In a **rectangular channel**, the discharge rate is $Q=15 \text{ m}^3/\text{sec}$, the channel bottom slope is $S_o=0.0025$. Water flows at uniform water depth before the enlargement and the step. The channel width before the enlargement is $B=5$ m. Take bottom roughness as $n=0.02$.
- Calculate the uniform water depth before the enlargement and determine the state of the flow.
 - Calculate the water depth after the step and the enlargement. Draw water surface profile and the specific energy curve.

