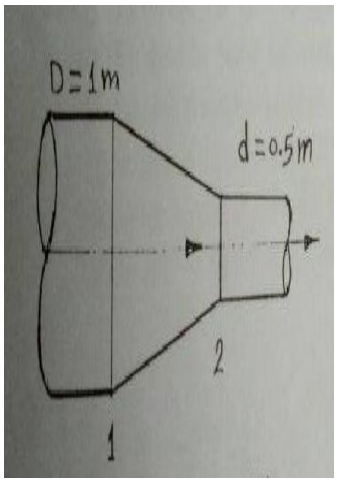
Sheet6

[3]for the flow of water through the shown pipe. The mercury manometer connected between points (1). (2) Reads 30 cm. The pressure at point 1 is 3m

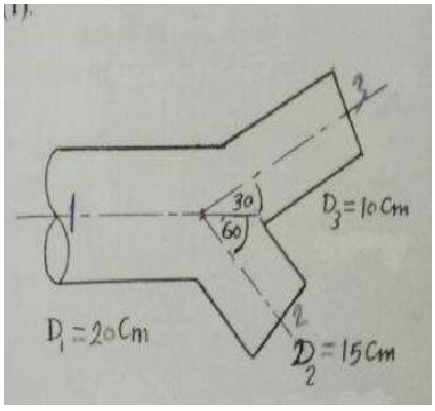


(a) Sketch the T.E.L. And H.G.L.

(b) Find the rate of flow.

(c) The magnitude and direction of the force exerted by the water.

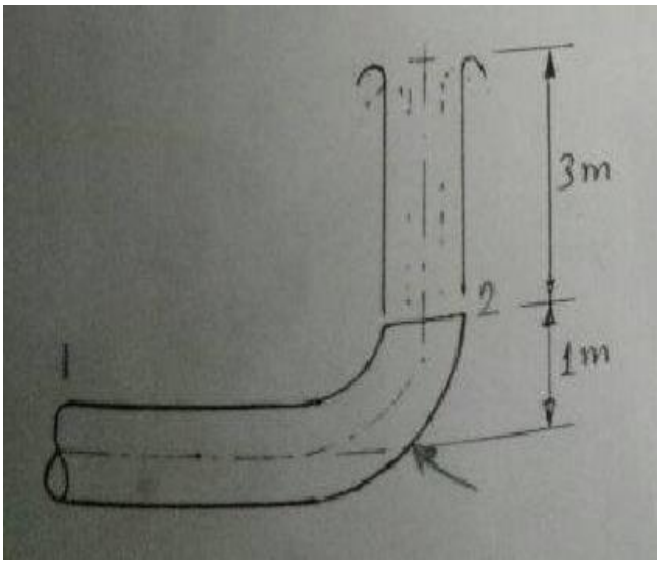
[4] A pipe ends with two nozzles. Both nozzles jets have a velocity of 20m/sec. the axis of the pipe and nozzles lie in horizontal plane, neglecting friction find:



(a) The discharge through the pipe (m^3/s)

(b) The magnitude and direction of the force exerted by the water on the body 1-2-3

[5] For the flow of water through the shown pipe and the vertical bend of diameter 0.2 m. the weight of the water in bend is 250N and the weight of the bend material is 1000N. Sketch the T.E.L. and the H.G.L. and then



Find

(a) The rate of flow in m^3/sec.

(b) The reaction on the support at point (1)

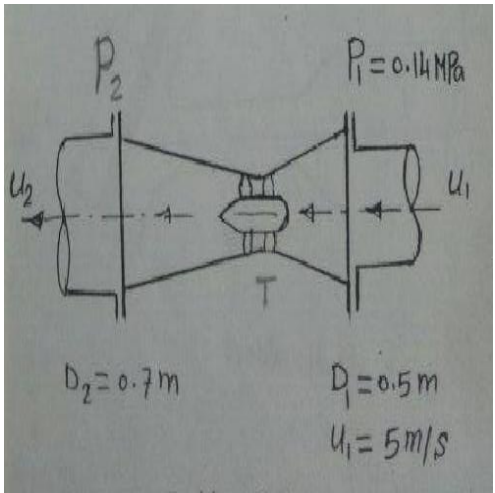
[6] IF the same discharge for the previous problem is maintained and a nozzle of diameter 10cm is mounted at point (2) Neglecting the weight and the height of the nozzle. Sketch the T.E.L and the H.G.L. and then find

(a) The new height of the jet

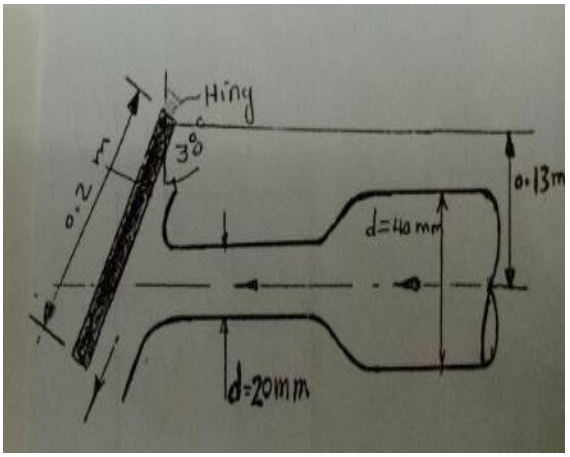
(b) The new reaction on the support at point (1).

[7]if the power exerted from the water by the turbine shown in figure is 12 kw , neglecting the losses and then calculate

(a) The pressure at the exit from the turbine casing



(b)the force exerted by the turbine casing on the flanges at (1),(2).



[8] A jet of water is directed at a uniform flat rectangular plate of mass 5 kg which is suspended from a hinge along the top edge as shown in figure . if the nozzle has $\mathbf{C_d}$=0.97 **Determine** the pressure required in the pipe upstream of the nozzle to maintain equilibrium with the plate inclined at 30^o to the vertical