Time: Two hours

Answer **all** questions

1. a. Explain the factors influencing on storm hydrograph with suitable diagrams.

   (50 Marks)

   b. A pipeline is connecting two reservoirs. The vertical distance between the surface levels of two reservoirs is 6 m. A total length of 720 m pipe rises to a height of 3 m above the upper reservoir at a distance of 240 m from the entrance before falling to the lower reservoir as shown in the figure. If the pipe is 1.2 m in diameter and the friction co-efficient $f = 0.01$, find the discharge and pressure at the highest point of the pipeline. (Energy degradation at entrance and exit is negligible)
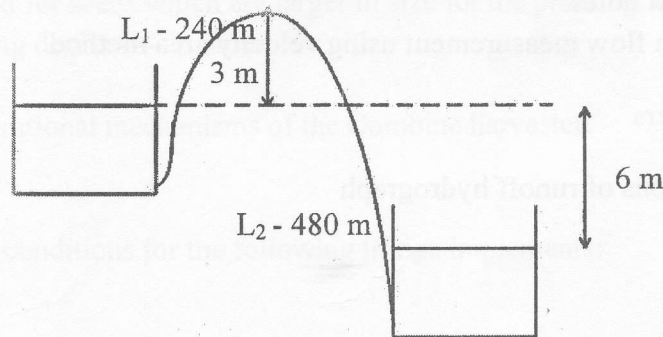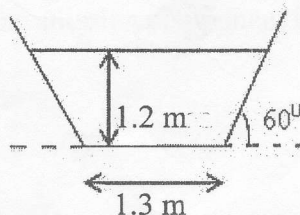

   (50 Marks)

2. a. List the basic assumptions of unit hydrograph. (15Marks)

   b. Briefly describe the characteristics features of saturated and unsaturated zones in soil.

   (40 Marks)

   c. An open channel of trapezoidal section with 1.3 m base and side slopes of 60^0 to the horizontal as shown in the figure is used to convey water at a constant depth of 1.2 m. If the channel bed slope is 1/500, compute the discharge in m^3/s. Assume chezy's constant, C is 49.
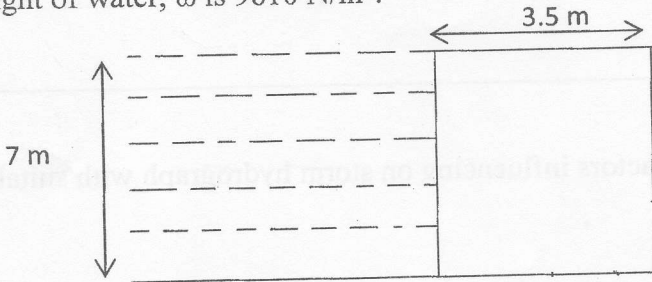
   (45 Marks)

   (Please Turn Over)

3. a. Describe the factors affecting infiltration capacity of soil.   (50 Marks)

   b. A rectangular masonry dam 7 m height and 3.5 m wide has water up to its top level as shown in the figure. The specific weight of the masonry dam is 19620 N/m³. Assume specific weight of water, ω is 9810 N/m³.

   Find out the following,

   i. Total pressure acting on 1 m length of the dam.
   ii. The point at which resultant force cuts the base.

   (50 Marks)

4. Write short notes
   a. Stream flow measurement using velocity area method   (30 Marks)

   b. Aquifers   (30 Marks)

   c. Divisions of runoff hydrograph   (40 Marks)

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