DEPARTMENT OF CIVIL ENGINEERIG, IIT DELHI

CEL 381 (Part AA)

Design of Hydraulic Structures

Time: 1.00PM-3.00PM **Date: 09-05-2018** **Room No. LH114** **Marks: 15**

Assume any Missing Data **Major** **Submit on Time**

DO NOT WRITE ANYTING IN QUESTION PAPER

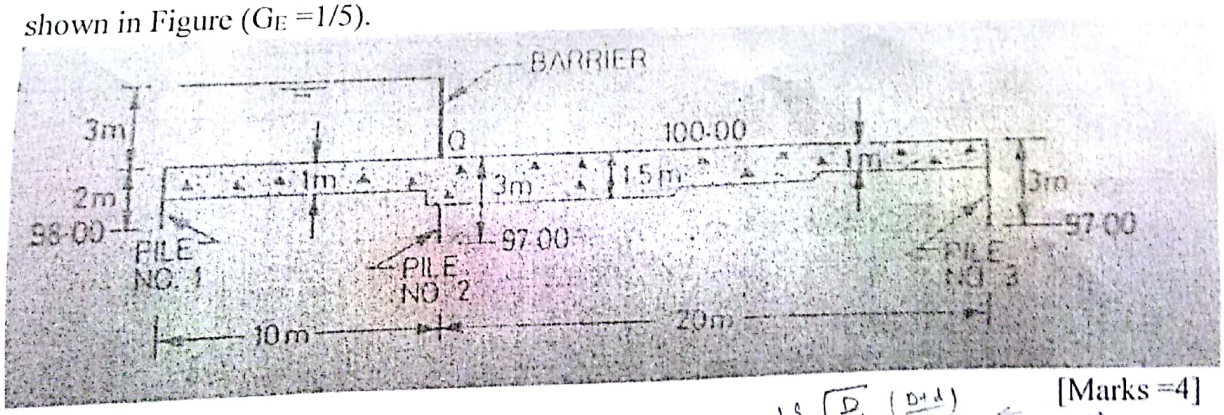
Answer sheet with no name will be treated as zero

1. Show that $t = \frac{h}{G-1}$, where notations are as usually specified. [Marks =2]

2. Design a Lacey's canal to carry a discharge of 5 m^3/s through 0.5mm diameter sand. [Marks =4]

3. Design a straight trapezoidal canal using tractive force concept for a design discharge of $10 m^3/s$. The bottom slope is 0.00025 and the canal is excavated through fine gravel having particle size of 8mm. Assume the particles are moderately rounded and the water carries for sediment at low concentrations.
{N=0.024, 3H:1V, $\phi = 24°$, Critical shear stress =7.18 N/mm^2} [Marks =3]

4. Calculate uplift pressures using Khosla's concept at (a) D/S pile and (b) Intermediate pile as shown in Figure (G_E =1/5).



[Marks =4]

5. Short Note with figure:

(a) Side Channel Spillway [Marks = 2]