DEPARTMENT OF CIVIL ENGINEERIG, IIT DELHI

CEL 381

Design of Hydraulic Structures

Time: 5.30PM-6.30PM Date: 06-02-2018 Room No. LH114 Marks: 20

Assume any Missing Data Minor I Submit on Time

1. Show that

(a) $P = 4.75\sqrt{Q}$; where P is the perimeter and Q is the Discharge.

(b) $R = \frac{y}{2\sqrt{2}}$; where R is the hydraulic radius for efficient triangular section and y is the depth of flow [2+2]

2. Design an irrigation canal to carry a discharge of 5 cumec and the channel has a bed slope of 0.2m per kilometre. Assume N=0.0225, m=1. [4]

3. Find the channel section and maximum discharge if the slope of the channel in the alluvium is found as 1/4000 [Assume Lacey's factor as 0.9 and side slope as ½:1]. [3]

4. Design a line canal to carry a discharge of 30 cumec whose slope is 1/1600. The side slope to be maintained at 1.25H:1V and N=0.014. [Marks=3]

5. Short Notes
   (a) Fish ladder
   (b) Lane's weighted creep theory [Marks=3]

6. Differentiate in Tabular format (one point contains 0.5 Marks)
   (a) Feeder Canal and Carrier Canal
   (b) Silt Ejector and Silt Excluder [Marks=3]