

# Department of Civil Engineering, IIT Delhi

2<sup>nd</sup> Minor Test, Date: 25-03-2014

## CEL 351 Design of Hydraulic Structures

Time: 1 hour

Room No. V LT1

Total Marks: 20

Assume any Missing Data

No Extra Time is allowed

**Submit on Time**

1. Explain Lacey's theory for the design of a canal. [Marks=4]
  
2. Show that  $S Q^{0.0202} / N^2 m^{2.02} = 0.299 \cdot [B/y + 2.236]^{1.333} / [B/y + 0.5]^{1.333}$  [Marks=4]  
where,  
S= Bed slope, N=Rugosity Coefficient, m= C.V.R., Q=Discharge, B= Width, y=Depth
  
3. Design a concrete line canal to carry a discharge of 400 m<sup>3</sup>/s of water at a slope of 1 in 10,000. The side slope to be maintained at 1.25:1. Take N=0.014. [Marks=4]
  
4. Design an irrigation canal to carry a discharge of 5 Cumec. Assume N=0.0225, m=1, B/y=3.24. [Marks=4]
  
5. Write short notes  
(a) Regime condition  
(b) Importance of Reduction Factor [Marks=4]