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Internal Assessment Test 1 – Mar. 2018

Sub:	APPLIED HYDRAULICS					Sub Code:	15CV43	Branch:	CIVIL	
Date:	13-03-18	Duration:	90 min's	Max Marks:	50	Sem/Sec:	IV/A&B		OBE	

Answer any **TWO from Part A** and **ALL from Part B**

		MARKS	CO	RBT
	Part A			
1 (a)	For the most economical trapezoidal section show that half of top width is equal to side slope length.	[07]	CO2	L2
(b)	A rectangular channel 4m wide and 1.5m depth of water has a bed slope of 1 in 1000 having N=0.02. Determine the discharge. What will be the dimensions of the channel for maximum discharge? Also compute percentage increase in discharge.	[08]	CO2	L3
2 (a)	Derive Chezy's equation for discharge through uniform flow in open channel.	[07]	CO2	L2
(b)	A trapezoidal channel with side slopes 1H to 4V has to be designed to convey $20m^3$ /s at a velocity of 2 m/s so that the amount of concrete lining for bed and sides is minimum. Calculate area of lining required per m length of channel.	[08]	CO2	L3
3 (a)	A trapezoidal channel of bed width 4m and side slope 1 in 3 is discharging water at the rate of 15 m^3 /s. Determine the following i) Critical depth ii) Minimum specific energy iii) What will be the type of flow in depths 0.8m and 1.5 m.	[07]	CO2	L3

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3 (b)	Find the diameter of a circular pipe which is laid at a slope of 1 in 4000 and carries a discharge of $5m^3/s$ when flowing half full. Take N=0.012.	[08]	CO2	L3

Part B

4 (a)	Derive an expression for energy loss in a hydraulic jump.	[05]	CO3	L2
(b)	A sluice gate discharges water into a horizontal rectangular channel with a velocity 1m/s and depth of flow 0.6m. The width of channel is 7m. Determine whether a hydraulic jump will occur or not. If so determine its height and loss of energy.	[05]	CO3	L3
5 (a)	Derive an expression for gradually varied flow.	[05]	CO3	L2
(b)	Find the slope of free water surface in a rectangular channel of width 15m having depth of flow 4m. The discharge through the channel is $25m^3$ /s. The bed of channel has a slope 1 in 4000. Take C=60.	[05]	CO3	L3

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