Total No of pages: *Roll No* _____

M.Tech/Ph.D (HWRE) **First SEMESTER**

SUPPLEMENTARY EXAMINATION **(FEBRUARY 2019)**

CE 533 Advanced Open Channel Hydraulics

Time : 3:00 Hours *Maximum Marks : 100*

Note : Answer all Five Questions, Assume suitable missing data, if any.

1) A trapezoidal channel having bottom width 8m and side slopes 1:1 carries a discharge of 80 m^3/Sec. Find the depth conjugate to initial depth of 0.75m before the jump. Determine the energy losses in the jump. (10)

2) Explain in detail with figures, various methods of control of jumps?. Also write the applications of hydraulic jump. (10)

3) Explain the various GVF profiles and mention their features. (10)

4) Plot the specific energy curve for a rectangular channel 5m wide carrying 10 cumecs. The maximum depth of flow in the channel is to be 3m. Determine the following from the curve.

a) Minimum specific energy

b) Alternate depths corresponding to a specific energy of 2.5 kg-m/kg.

c) The critical depth of flow

Also verify your results using analytical means. (15)

P.T.O.

5) A 1.5 m wide rectangular channel carries a discharge of 5.0 m^3/sec at a depth of 1.5m. At a section the channel undergoes transition to a triangular section of side slopes 2H:1V. If the flow in the triangular section is to be critical without changing the upstream water surface, Find the location of the vertex of the triangular section relative to the bed of rectangular channel. What is drop/rise in the water surface at the transition? Assume zero energy loss at the transition. (15)

6) A 1.8 m wide rectangular flume carries 1.8 m^3/sec of water. At a certain section A, the depth of water is 1m. If the bed slope of the channel is 0.0004, determine the distance from A to a section where the depth is 0.8 m. Solve by single step method. n = 0.013. Is the surface profile backwater curve or drawdown curve? Name the profile. (20)

7) A trapezoidal channel having 6 m wide at bottom, 2H: 1V side slope, bed slope 0.0016 and n=0.025 carries a discharge of 11.3 m^3/sec. Compute the backwater profile created by a dam which backs up the water to a depth of 1.52 m immediately behind the dam. The upstream end of the profile is assumed at a depth of 1% greater than the normal depth. (20)