No. of Printed Pages : 2

ET-540(B)

B.Tech. Civil (Construction Management)

02356

Term-End Examination

June, 2010

ET-540(B) : FLOW IN OPEN CHANNEL

Time : 3 hours *Maximum Marks : 70*

*Note : Answer **any five** questions. Give neat, labelled sketches where necessary.*

1. (a) Sketch the water surface profile for the following cases :

   (i) A steep slope, the flow being obstructed by a barrier over which the flow continues. Name the profile. 3

   (ii) A mild slope followed by a steep slope. Name the profile. 3

   (b) A trapezoidal channel carriers water at a velocity of 1 m/sec. If $S_f = 0.0001$ and $n = 0.013$, determine R. 3

   (c) Find the area of flow for a trapezoidal channel if $b = 2.00$ m, $y = 1.5$ m and $z = 1$. 5

2. A rectangular channel ($b = 1.75$ m) has a bed slope of 0.00025 and $n = 0.015$, carries a flow of 2.5 m^3/s. Find the normal depth of flow. 14

3. Derive the formulae for hydraulic radius of the following channels : 4x3½=14

(a) A trapezoidal channel

(b) A semicircular channel, running full

(c) A triangular channel

(d) A rectangular channel

4. (a) What do you understand by a hydraulic jump ? Why are these jumps formed ? 3

(b) Explain how to locate a jump with the help of specific energy and specific force curves ? 11

5. (a) List the methods available to compute water surface profiles. 3

(b) Discuss in detail any one of these methods. Give also the table of computations. 11

6. (a) Draw a labelled sketch of Moody diagram (f vs R_e) for open channels. 8

(b) Discuss the use of this diagram in solving flow problems. 6

7. Write short notes on ***any four*** of the following : 14

(a) Froude No. and Reynolds No.

(b) Uniform and non-uniform flow.

(c) Velocity distribution in various cross-sectional shapes of an open channel.

(d) Pipe flow Vs open channel flow.

(e) Waves in a water body.

(f) Gradually and rapidly varied flow.