No. of Printed Pages : 2

ET-540(B)

B.Tech. Civil (Construction Management)

Term-End Examination

December, 2011

01649

ET-540(B) : FLOW IN OPEN CHANNEL

Time : 3 hours *Maximum Marks : 70*

*Note : Answer **any five** questions. All questions carry **equal** marks. Give neat and labelled sketches. Use of scientific calculator is permitted.*

1. (a) A trapezoidal channel (b = 2.5 m ; z = 1.5) carries water at y = 1.35 m with its bed slope of 0.0005. Calculate : 9
   (i) top width
   (ii) hydraulic mean depth
   (iii) section factor.
   (b) Determine Q in (a) above 5

2. (a) A circular channel (D = 1.0 m) is running half full. If the bed slope of the channel is 0.00035, and n = 0.025, determine the velocity of flow. 10
   (b) In (a) above, if D = 1.5 m, compare the velocities of flow of (a) and (b). 4

3. Discuss how the kinetic energy is dissipated at the toe of spillways. Describe, with sketches, one such standard device. **14**

4. (a) What is a control section ? Give three practical - situation examples. **7**

   (b) How are the three zones determined in a gradually varied flow ? What data is required for this purpose ? **7**

5. A rectangular natural channel ($b = 60.0$ m) carries a flow at $y = 2.5$ m and bed slope $= 0.00045$. A barrier across the channel raises the water level by 1.0 m above the normal depth behind itself. Take $n = 0.04$, and compute the length of G.V.F. from the barrier to an upstream location where $y = y_n + 0.5$ m. **14**

6. (a) Name the various methods to compute Gradually Varied Water Surface Profiles. **4**

   (b) Explain in detail the Graphical Integration Method. **10**

7. Write short notes on ***any four*** of the following : **4x3½=14**

   (a) Isovels

   (b) Manning's equation

   (c) Hydrostatic pressure

   (d) Mean velocity of flow

   (e) Hydraulic exponent
