ET-540(B)

00602

B.Tech. CIVIL (CONSTRUCTION MANAGEMENT) (BTCM)

Term-End Examination

June, 2019

ET-540(B) : FLOW IN OPEN CHANNEL

Time : 3 hours *Maximum Marks : 70*

*Note : Answer **any five** questions. Use of scientific calculator is permitted.*

1. (a) How open channel flow is different from pipe flow ? Discuss in detail giving suitable examples. 7

   (b) What is Reynolds Number ? How does it help in classification of a flow ? 7

2. (a) Define the following : 4x2=8

   (i) Prismatic channels

   (ii) Hydraulic radius

   (iii) Artificial channels

   (iv) Section factor

   (b) A rectangular channel is having a bottom width of 5.0 m and depth of flow is 2.0 m. Calculate the wetted perimeter and hydraulic radius for the channel. 6

3. (a) Define specific energy. Draw and explain   7
        the specific energy curve for an open
        channel.

   (b) A rectangular channel expands smoothly   7
        from a width of 2 m to 4 m. Upstream of
        the expansion the depth of flow is 1.5 m and
        velocity of flow is 2.5 m/s. Find the depth
        of flow after the expansion.

4. (a) Define specific force. Discuss its importance   7
        in open channel flow studies.

   (b) Water flows in a horizontal channel with a   7
        velocity of 6.0 m/s at a depth of 1.5 m.
        Calculate the length of hydraulic jump.

5. (a) Describe the basis of classification of flow   6
        profiles.

   (b) Draw and discuss flow profiles at a drop   8
        for following conditions :
        (i)   Mild slope
        (ii) Steep slope
        (iii) Horizontal slope
        (iv) Adverse slope

6. (a) What is control section ? Describe different   7
        types of control section.

   (b) Describe the 'standard step method' of   7
        computation of water surface profile.

7. Write short notes on **any four** of the following :
   (a) Froude Number   **4x3.5=14**
   (b) Modified Moody Diagram
   (c) Location of Hydraulic jump
   (d) Effect of Bed Curvature on Hydrostatic
        Pressure Distribution in an Open Channel
   (e) Ganguillet - Kutter's Equation