B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

June, 2018

00433

BICE-025 : HYDRAULICS AND HYDRAULIC MACHINES

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume missing data, if any.*

1. Describe critical depth, critical velocity, specific energy and specific force. $4 \times 2\frac{1}{2} = 10$

2. Describe the classification of flow in open channels. *10*

3. Derive the conditions needed for the most economical trapezoidal channel. *10*

4. Find the diameter of a circular sewer pipe which is laid at a slope of 1 in 8000 and carries a discharge of 800 L/s when flowing half full. Assume Manning's n = 0·020. *10*

5. Derive the expression for loss of energy due to a hydraulic jump. *10*

6. A sluice gate discharges water into a horizontal rectangular channel with a velocity of 6 m/s and depth of flow is 0·4 m. The width of channel is 8 m. Determine whether a hydraulic jump is formed and if so, find its height and loss of energy per kg of water. Also determine the power lost in the hydraulic jump. *10*

7. Describe a centrifugal pump and its main parts, with the help of a neat sketch. *10*

8. With neat diagrams, explain the GVF of open channel. *10*

9. What is specific speed ? Derive the equation for specific speed of a turbine. *2+8*

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