

Code No: 154BA**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year II Semester Examinations, August/September - 2021****HYDRAULICS AND HYDRAULIC MACHINERY****(Civil Engineering)****Time: 3 Hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

1. Define most economical channel of the section and explain the conditions for the rectangular channel of the best section? [15]
2. Prove that for a channel of circular section, the depth of flow 'd' is 0.81 D for maximum velocity and 0.95 D for maximum discharge, Where D = diameter of circular channel. [15]
3. By applying the momentum equation to open channel flow, show that the consequent depths and flow rate are related by $2q^2/g = y_1 y_2 (y_1 + y_2)$. [15]
4. The depth of flow of water, at a certain section of a rectangular channel of 5 m wide is 0.6 m. The discharge through the channel is $15 \text{ m}^3/\text{s}$. If a hydraulic jump takes place on the downstream side, find the depth of flow after the jump. [15]
5. What is the significance of non-dimensional numbers, Reynold's number, Froud number and Mach number in the theory of similarity? [15]
6. The variable controlling the motion of a floating vessel through water are the drag force F, the speed V, the length L, the density ρ and dynamic viscosity μ of water and acceleration due to gravity g. Derive an expression for F by dimensional analysis. [15]
7. Define specific speed of a turbine. Explain the significance in the study of hydraulic machines. [15]
8. What do you understand by characteristic curves of a pump? Explain is the significance of the characteristic curve. [15]

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