JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, November/December - 2020
HYDRAULICS AND HYDRAULIC MACHINERY
(Civil Engineering)

Time: 2 Hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 75

Answer any Five Questions
All Questions Carry Equal Marks
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1. Prove that for trapezoidal channel of most economical section Half of top width is equal to length of one of the sloping side. [15]

2. Find the critical depth and critical velocity of water flowing through a rectangular channel of width 5 m, when discharge is 15 m^3/s. [15]

3. Find the rate of change of depth of water in rectangular channel of 10m wide and 1.5 m deep, when the water is flowing with a velocity of 1 m/s. The flow of water through the channel bed slope 1 in 4000, is a regulated in such a way that energy line is having a slope of 0.00004. [15]

4. Write the applications and types of hydraulic jumps. [15]

5. What do you mean by repeating variables? How are repeating variables selected for dimensional analysis? [15]

6.a) Obtain an expression for the force exerted by a jet of water on fixed vertical plate in the direction of the jet.
  b) Show that the efficiency of a free jet striking normally as series of flat plates mounted on the periphery of a wheel never exceed 50%. [8+7]

7.a) What is cavitation? How can it be avoided in reaction turbine?
  b) A power develops 9000 kW when running at 10 r.p.m. The head on the turbine is 30 m. If the head of the turbine s reduced to 10m, determine the speed and the power developed by the turbine. [8+7]

8.a) Draw and discuss the operating characteristics of a centrifugal pump.
  b) Briefly state the significance of similarity parameters in hydraulic pumps. [8+7]

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