Code No: 154BA

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, July/August - 2021
HYDRAULICS AND HYDRAULIC MACHINERY
(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. What is specific energy curve? Draw specific energy curve, and then derive expressions for critical depth and critical velocity. [15]

2. Derive an expression for the variation of the depth along the length of the bed of the channel for gradually varied flow in an open channel. State clearly all assumptions made? [15]

3. Derive the expression for loss of energy head for a hydraulic jump from the fundamentals. [15]

4. State Buckingham's π-theorem. What do you mean by repeating variables? How are the repeating variables selected in dimensional analysis? [15]

5. An Outward flow reaction turbine has internal and external diameters of the runner as 0.55 m and 1.25 m respectively. The turbine is running at 255 rpm and rate of flow of water through the turbine is 8 m^3/s. The width of the runner is constant at inlet and out let and is equal to 30 cm. The head on the turbine is 10 m and discharge at outlet 6 is radial, determine: a) Vane angle at inlet and outlet. b) Velocity of flow at inlet and outlet. [7+8]

6. Define cavitation. What are the effects of Cavitation? Give the necessary precautions against Cavitation. [15]

7. Draw a neat sketch of centrifugal pump and explain the working principle of the centrifugal pump. [15]

8. Distinguish between open channel flow and pipe flow clearly. Explain about different types of open channels. [15]

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