Code No: R1622013 **R16** SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2019
HYDRAULICS AND HYDRAULIC MACHINERY
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define Specific energy.
   b) Define hydraulic jump.
   c) Define kinematic similarities.
   d) Define NPSH.
   e) What are the different types of draft tube?
   f) Write the purpose of Kaplan turbine.

PART -B

2. a) Give complete classification of the different types of open channel flow.
   b) Find the energy loss that can occur in a hydraulic jump in terms of depths.

3. a) Derive the condition for most economical section for a trapezoidal channel.
   b) A trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of the bed is 1 in 1500. The area of the section is $40m^2$. Find the dimensions of the section if it is most economical. Also find the discharge of most economical section if c=50.

4. a) Derive the expression for force exerted by a jet on stationary inclined flat plate.
   b) Find the force exerted by the jet on a stationary vertical plate.

5. a) Derive the expression for stationary and moving flat plate with sketch.
   b) A jet of water of diameter 50*mm* strikes a fixed plate in such a way that the angle between the plate and the jet is 30^0. The force exerted in the direction of the jet is 1471.5N. Determine the rate of flow of water.

6. Obtain an expression to the work done per second by water on the runner of a Pelton wheel. Hence derive an expression for maximum efficiency of the Pelton wheel giving the relationship between the jet speed and the bucket speed.

7. Draw a typical layout and explain the working of centrifugal pump. Also indicate various components.
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