

Code No: RT22012

**R13**

**SET - 1**

**II B. Tech II Semester Supplementary Examinations, April-2018**  
**HYDRAULICS AND HYDRAULIC MACHINERY**  
**(Civil Engineering)**

Time: 3 hours

Max. Marks: 70

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

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**PART -A**

1. a) Classify different Types of flows with sketch
- b) What is model write with example
- c) Classify different types of turbines according to speed
- d) Write about work done and efficiency
- e) Define specific speed
- f) What is Load factor

**PART -B**

2. a) An open channel of trapezoidal section, 2.5 m at the base and having sides inclined at 60° to the horizontal, has a bed slope of 1 in 500. It is found that when the flow is 1.5 m<sup>3</sup>/s the depth of water in the channel is 0.5 m. Assuming the validity of the Manning's formula., calculate the flow when the depth is 0.7 m.
- b) Differentiate between uniform and non-uniform flow; laminar and Turbulent flow.
3. a) Explain about Buckingham's pi theorem
- b) Define the term Reynold's number and Froude's number and Differentiate between Tranquil and Torrential flow in open channel.
4. The internal and external diameter of an outward flow reaction turbine are 2.5m & 3m respectively. The turbine is running at 275 rpm and the rate of flow of water through the turbine is 7m<sup>3</sup>/sec. the width of runner at inlet and outlet is equal to 300mm. head on turbine is 150m. neglecting the thickness of vanes and taking the discharge radial at outlet, determine
  1. Velocity of flow at inlet and outlet
  2. Vane angle at inlet and outlet
5. Explain the principle behind a centrifugal pump and also explain its working with a neat sketch.
6. a) What is priming of a centrifugal pump? Why is it necessary?
- b) What is the difference between single stage and multistage pumps?
7. Explain underground powerhouse and types of arrangement of underground powerhouse with neat sketches