Code No: R1621016 **R16** SET - 1

II B. Tech I Semester Supplementary Examinations, May - 2019
FLUID MECHANICS
(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) What do you understand by hydrostatic law?
   b) What is rotational and irrotational flow?
   c) What are the assumptions made in Bernoulli's equation?
   d) What is momentum equation?
   e) What is a weir? How are weirs classified?
   f) What are the factors effecting boundary layer thickness?

PART -B

2. a) State and prove Pascal's law.
   b) Calculate specific weight, density and weight of two liters of a petrol of specific gravity 0.7 N.

3. a) Explain flownet analysis.
   b) The flow field of a fluid is given by $V= xyi + 2yzj–(yz + z^2)k$. Show that it represents a possible three dimensional steady incompressible continuous flow.

4. a) What is Euler's equation? How will you obtain Bernoulli's equation from it?
   b) Water is flowing through a pipe of 5cm diameter under a pressure of $29.43 N/cm^2$(gauge) and with mean velocity of 2.0m/s. find the total head or total energy per unit weight of the water at a cross-section, which is 5m above the datum line.

5. a) Write a note Hardy-Cross method.
   b) Explain the minor losses in pipe in series and parallel.

6. a) Write briefly and Sketch neatly the following
      i) Venturimeter, ii) Pitot tube and iii) Orifice meter
   b) A right angled V-notch is used for measuring a discharge of 30 l/s. an error of 2mm was made in measuring the head over the notch. Calculate the percentage error. Take C_d=0.62.
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7. a) Discuss the following
   i. The concept of the boundary layer with reference to fluid motion over a flat plate
   ii. Phenomenon of separation for flow over carved surfaces
   iii. The prevention of separation

   b) The velocity distribution in the boundary layer is given as $\frac{u}{v} = \frac{3}{2}\eta - \frac{1}{2}\eta^2$ in which η=(y/δ).Compute (δ*/δ) and (θ/δ).