

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**

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 affecting boundary layer thickness?

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 29.43N/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 $C_d=0.62$.

7. a) Discuss the following
- The concept of the boundary layer with reference to fluid motion over a flat plate
 - Phenomenon of separation for flow over curved surfaces
 - The prevention of separation
- b) The velocity distribution in the boundary layer is given as $\frac{v}{V} = \frac{5}{2}\eta - \frac{1}{2}\eta^2$ in which $\eta = (y/\delta)$. Compute (δ^*/δ) and (θ/δ) .

