

310306

Roll No. 18EMCCED72

Total No of Pages: 2

310306

B. Tech. III Sem. (Main) Exam., Dec. - 2019

Civil Engineering

3CE4-06 Fluid Mechanics

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5×2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem Solving questions 4×10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2×15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART - A**

- Q.1 What are the different types of fluids? [2]
- Q.2 Explain Meta centric height. [2]
- Q.3 Write Hagen–Poiseuille equation with all its notations. [2]
- Q.4 Define turbulent flow. [2]
- Q.5 What is Darcy – Weisbach equation? [2]

[310306]

Page 1 of 2

[2040]

PART – B

- Q.1 Derive the expression for surface tension on a liquid droplet. [10]
- Q.2 Explain the working of a Bourdon's pressure gauge with a neat diagram. [10]
- Q.3 State and Prove Pascal's Law. [10]
- Q.4 Derive Darcy's equation for head loss through pipes. [10]
- Q.5 Three pipes of lengths 800m, 500m and 400m having diameters 500 mm, 400 mm and 300 mm respectively are connected in series. These pipes are to be replaced by a single pipe of length 1700 m. Find the diameter of the single pipe. [10]
- Q.6 What is Venturimeter? Derive an expression for the discharge through a Venturimeter. [10]

PART – C

- Q.1 State the assumptions made in deriving the Euler's equation of motion. Hence obtain Bernoulli's equation from Euler's equation with a neat sketch. [15]
- Q.2 Prove that ratio of maximum velocity to average velocity for laminar flow between two stationary parallel plates is 1.5. [15]
- Q.3 Explain with sketches differential and simple manometers. [15]
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