

C.U.SHAH UNIVERSITY

Summer Examination-2020

Subject Name : Fluid Mechanics -I

Subject Code : 4TE03FLM1

Branch: B.Tech (Civil)

Semester : 3

Date : 05/03/2020

Time : 02:30 To 05:30

Marks :70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1

Attempt the following questions:

(14)

- a) Bernoulli's equation is based on which law.
- b) Define Bouncy.
- c) Friction loss in pipes is also called----- loss.
- d) What is meant by ideal fluid?
- e) Write the relationship between density and specific weight.
- f) Draw the stress-strain relation of the Newtonian fluid.
- g) Write down the units of kinematic viscosity.
- h) Enumerate the classification of manometer.
- i) Define gauge pressure.
- j) What is meant by crest?
- k) Write Darcy - Weisbach formula for calculating head loss.
- l) What is Syphon?
- m) In a pipe flow, If the Reynolds number is more than 4000, the flow is said to be --
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- n) The Bernoulli's equation is based on conservation of
 - a) Mass
 - b) Energy
 - c) Angular Momentum
 - d) Linear Momentum



- Q-7** **Attempt all questions** **(14)**
- (a) A wooden block of width 3m, depth 1.5m and length 4m floats horizontally in water. Find the volume of water displaced and position of centre of buoyancy. Specific gravity of the wooden block is 0.72. **07**
- (b) Water flows through a pipe AB 1.2 m diameter at 3 m/s and then passes through a pipe BC 1.5 m diameter. At C, the pipe branches. Branch CD is 0.8 m in diameter and carries one third of the flow in AB. The flow velocity in branches is CE is 2.5 m/s. Find the volume rate of flow in AB, the velocity in BC, the velocity in CD and the diameter of CE. **07**
- Q-8** **Attempt all questions** **(14)**
- (a) The head of water over an orifice of diameter 100 m is 10 m. the water coming out from orifice is collected in a circular tank of diameter 1.5 m. the rise of water level in this tank is 1 m in 25 seconds. Also the co-ordinate of a point on jet, measured from vena-contracta are 4.3 m horizontal and 0.5 m vertical. Find the Coefficients C_d , C_v and C_c . **07**
- (b) A 30 cm x 15 cm venturimeter is inserted in vertical pipe carrying water, flowing in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 20 cm. find discharge. take $C_d = 0.98$ **07**

