Total No. of printed pages = 3

CT-403/FM/4th Sem/2018/M

FLUID MECHANICS

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

1. Answer the following questions : 2×10=20

   (i) What do you mean by viscosity ?

   (ii) What do you mean by fluid kinematics and fluid dynamics ?

   (iii) What do you mean by total pressure ?

   (iv) What do you mean by laminar and turbulent flow ?

   (v) What do you mean by hydraulic grade line and energy grade line ?

   (vi) Write a short note with figure on inverted u-tube manometer.

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(vii) Write down about the different types of flows.

(viii) Write down the Manning's formula and its use in channel flows.

(ix) Chezy's equation used for which types of flows ?

(x) What do you mean by mass density ?

2. Write down the definition of following : $1 \times 5 = 5$

(i) Specific weight of fluid

(ii) Fluid pressure

(iii) Specific gravity of fluid

(iv) Hydraulic efficient channel

(v) Path line.

PART – B

1. Find the velocity of flow and rate of flow of water through a rectangular channel of 6 m wide and 3m deep, when it is running full. The channel has bed slope as 1 in 2000. Take Chezy's constant (C) = 55. 10

2. If specific gravity of pure water is 1.0 at $4^{o}C$, then calculate its mass density, specific weight and specific volume. 10

3. Derive the mathematical expression for loss of head due to sudden contraction of pipe. 10

4. A horizontal venturimeter with inlet diameter 20 cm and throat diameter 10 cm is used to measure the flow of water. The pressure at inlet is 17.658 N/cm^2 and the vacuum pressure at the throat is 30 cm of mercury. Find the discharge of water through venturimeter. Take Cd = 0.98. 15