



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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COIMBATORE-641 035, TAMIL NADU



DEPARTMENT OF AEROSPACE ENGINEERING

Faculty Name : **Dr.A.Arun Negemiya,** Academic Year : **2024-2025 (Odd)**
AP/ Aero
Year & Branch : **II AEROSPACE** Semester : **III**
Course : **23AST202 – Fluid Mechanics for Aerospace**

UNIT I - FLUID PROPERTIES AND FLOW CHARACTERISTICS

1. A 20x10 cm Venturimeter is provided by a vertical pipe line carrying oil of $G=0.8$. The difference in elevation of the throat section and entrance section of Venturimeter is 0.5 m. The differential U tube Venturimeter shown a gauge difference of 40 cm, Calculate the discharge of oil and pressure between entrance section and throat section. Take $C_d = 0.92$.

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Steps:

$$D_1 = 20 \text{ cm}$$

$$D_2 = 10 \text{ cm}$$

$$a_1 = 314.16 \text{ sq.cm and } a_2 = 78.5 \text{ sq.cm}$$

$$h = x(S_2/S_1) - 1 = ((p_1/w) + Z_1) - ((p_2/w) + Z_2)$$

$$h = 0.4((13.6/0.8) - 1) = 6.4 \text{ m}$$

$$6.4 = (p_1/w + 0) - (p_2/w + 0.5)$$

$$p_1/w - p_2/w = 6.9 \text{ m}$$

$$Q = (C_d a_1 a_2 (2gh)^{1/2}) / (a_1^2 - a_2^2)^{1/2}$$