Roll No. | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME)(2011 Onwards) (Sem.–4)

FLUID MECHANICS

Subject Code : BTME-403

Paper ID : [A1213]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Differentiate between Real fluid and Ideal fluid.

   b) Explain Hydrostatic Law.

   c) Differentiate between Newtonian and non-newtonian fluid.

   d) What is a manometer?

   e) Describe piezometer.

   f) Explain equation of continuity.

   g) Differentiate between uniform and Non-uniform fluid.

   h) Define weber number.

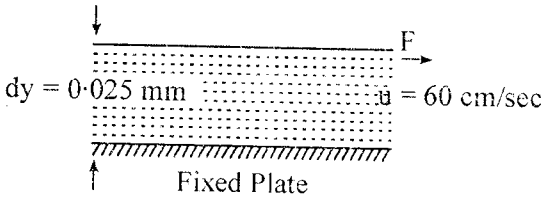
   i) What is Darcy Equation?

   j) Differentiate between laminar and turbulent flow

SECTION-B

2. Derive Bernoulli's equation using principle of conservation of energy.

3. A plate 0.025mm distant from a fixed plate, moves 60cm/s requires a force of 2N per unit area *i.e.*, 2 N/m^2 to maintain this speed. Find fluid viscosity between the plates.



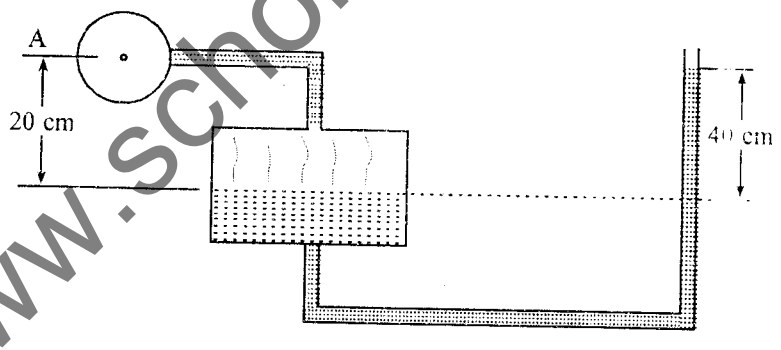
4. Determine velocity of flow of radii of 0.2m, 0.4m and 0 8m, when water is flowing radially outward from a source at strength of 12 m^2/s

5. Prove that maximum velocity in circular pipe for viscous flow is equal to two times average velocity of flow.

6. Define stream function and velocity potential function. Also explain the relation between them.

SECTION-C

7. A single column manometer is connected to a pipe containing a liquid of specific gravity 0.9 as shown in figure. Find the pressure in the pipe if the area of reservoir is 100 times the area of tube for manometer reading shown in figure. The specific gravity of mercury is 13.6.



8. The head of water over the centre of orifice of diameter 20mm is 1 m. The actual discharge through orifice is 0.85 lt/sec. Find the coefficient of discharge.

9. Derive Euler's equation of motion in Cartesian coordinates.