Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ME) (Sem.–4) (2011 Batch)

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 :

(i) Differentiate solids and fluids.

(ii) What is Pascal's law and what are its engineering applications?

(iii) Discuss metacentric height with respect to stability and comfort.

(iv) What are the various ways of describing a flow pattern?

(v) Define circulation and vorticity.

(vi) What is momentum correction factor and what is its significance?

(vii) Write a note on model studies.

(viii) What are the flow regimes envisaged by Reynolds?

(ix) Explain the concept of equivalent pipe.

(x) What are the characteristics of a steady free water jet discharging from an orifice fitted in a tank?

SECTION-B

2. A vertical isosceles triangular gate is immerse up. The base width of gate is 2 m and height 1 1 m below the free water surface. Determine t its location.

3. The stream function in two-dimensional flov Verify whether the flow is irrotational and det the potential function. Also, determine the di point (1, –1).

4. Derive Bernoulli's equation for flow along a str

5. Due to sudden enlargement of a horizontal pipe 600 m diameter, hydraulic gradient line rise discharge.

6. A venturimeter is used for the measurement o pipe. The ratio of upstream pipe diameter to t diameter being 300 mm. If differential pressure and throat is equal to 3 m head of water and meter is one-eight of the throat velocity head, pipe.

SECTION-C

7. A conical thrust bearing idealized as a cone of cone diameter 200 mm, rests and revolves ab fluid layer of thickness 1 mm at 600 rpm. If v calculate the power lost in overcoming the visc

8. Two pipes each 300 m long are available for from which a flow of 0.085 m^3/s is required pipes are 300 mm and 150 mm respectively, d lost when the pipes are connected in serie connected in parallel. Neglect minor losses.

9. A fluid flow situation depends upon velocity Δp, gravity g, length l, diameter d, viscosity bulk modulus of elasticity K. Find a set of dim π-theorem method of dimensional analysis.