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

Total No. of Questions : 18

B.Tech. (ME) (2018 Batch) (Sem.–3)

FLUID MECHANICS

Subject Code : BTME-301-18

M.Code : 76417

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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 have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. Define Specific Volume and state its units.
2. State Newton's law of viscosity.
3. State Pascal Law.
4. Explain stable equilibrium of submerged body.
5. Define laminar and turbulent flow.
6. Define Vortex Motion.
7. What is the difference between model and prototype?
8. What are the various losses occurred in pipes?
9. Define Coefficient of Resistance.
10. What is Mach number?

SECTION-B

11. What do you mean by Surface Tension? If the pressure difference between the inside and outside of the air bubble of diameter 0.01mm is 29.2 kPa, what will be the surface tension at air-water interface?

12. A wooden block of specific gravity 0.75 floats in water. If the size of block is such that its length is 1 m, width is 0.5 m and height is 0.4 m, find its metacentric height.

13. The velocity potential function for a two dimensional flow is equal to $x(2y–l)$. Find velocity at point P(4,5) and calculate stream function at this point also.

14. Derive equation for sudden enlargement loss in pipes.

15. Explain the working of rota-meter with neat sketch.

SECTION-C

16. Derive Darcy Weisbach Equation for losses in pipes.

17. Derive continuity equation in cylindrical co-ordinates.

18. The pressure difference in a pipe of diameter D and length l due to turbulent flow depends on the velocity V, dynamic viscosity, density and roughness k. Use Buckingham's Pi theorem obtain expression for pressure difference.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.