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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 compressibility and bulk modulus.
2. State Pascal's law.
3. State different types of fluid flow.
4. Define Buoyancy.
5. Define stream function and potential function.
6. What do you mean by dimensional homogeneity and what are its applications?
7. What are various losses in pipes?
8. Show stable equilibrium of floating body with diagram.
9. Define Euler number.
10. Name the five model laws of similarity in Dimensional Analysis.

SECTION-B

11. Derive an expression for the time period of oscillation of a floating body in terms of radius of gyration and meta-centric height of floating body.
12. The stream function for a two dimensional flow is given by $2xy$, Calculate the velocity at the point (2, 3). Find the velocity potential function also.
13. Derive continuity equation in cylindrical coordinates.
14. Discuss Kinetic Energy Correction and Momentum Correction Factors.
15. Evaluate the relation between stream function and velocity potential function.

SECTION-C

16. Water flows through a triangular right angled weir and then over a rectangular weir of 1m width. The discharge coefficients of the triangular and rectangular weirs are 0.6 and 0.7 respectively. If the depth of water over the triangular weir is 360 mm, find the depth of water over the rectangular weir.
17. Show that momentum correction factor for laminar flow through a circular pipe is $4/3$.
18. The pressure difference in a pipe of diameter D and length l due to turbulent flow depends upon the velocity V , viscosity, density, and roughness k . Using Buckingham's pi theorem obtain an 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.