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

Total No. of Questions : 18

B.Tech. (AE) (2012 to 2017) (Sem.–4)

FLUID MECHANICS AND MACHINERY

Subject Code : BTAE-403

M.Code : 54124

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 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

Answer briefly :

1. Define Newtonian fluid.
2. What is metacentric height?
3. How Euler's equation is different than steady flow energy equation?
4. Write short note on flow along a curved streamline.
5. What are dimensions of kinematic viscosity and dynamic viscosity?
6. Define Darcy equation.
7. What is difference between venturi meter and orifice meter?
8. Write short note on intensifier.
9. List different types of pumps.
10. If specific gravity of a liquid is 0.8, make calculation for its mass density and specific weight.

SECTION-B

11. Define compressibility. How it is related to bulk modules of elasticity?

12. Describe with equations action of fluid pressure on a horizontal and inclined plan.

13. A pipe 300 m long has a slope of 1 in 100 and tapers from 1 m diameter at high end to 05 m at low end. Quantity of water flowing is 5400 1/min. If pressure at the high end is 70kPa, find pressure at the low end.

14. With sketch explain different conditions of stability of immersed and floating bodies.

15. The thrust T of a propeller depends on its diameter D, the fluid density p, dynamic viscosity μ, revolution per unit time N and velocity V of advance with respect to the undisturbed fluid. By mean of dimensional analysis show that the appropriate non-dimensional parameters are :

    $T = \rho D2V2f(\mu/VD\rho, DN/V)$

SECTION-C

16. What are basic components of turbo machine? Classify turbo machine on the bases of purpose and illustrate them.

17. A hollow cylinder closed at both ends has an outside diameter of 1.25 m, length 3.5 m and specific weight 75kN/m^3. If the cylinder is to float just in stable equilibrium in sea water, find its minimum permissible thickness. Presume that sea water weighs 10 kN/m^3.

18. Discuss about following :

    a) Ideal and real fluids,

    b) Stream and velocity potential function

    c) Manometer.

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.