Reg. No. : | | | | | | | | | | |

Question Paper Code: 33704

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Mechanical Engineering

01UME304 – FLUID MECHANICS AND MACHINERY

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define surface tension.
2. What is moment of momentum equation?
3. Define boundary layer and give its significance.
4. Differentiate Orifice meter and venturi meter.
5. Define Reynolds number.
6. List any two dimensionless parameters and their field of application.
7. Define specific speed of a turbine.
8. What is Cavitation?
9. Why is priming necessary in centrifugal pumps?
10. Compare positive displacement pumps with dynamic Pumps.

PART - B (5 x 16 = 80 Marks)

11. (a) The velocity distribution over a plate is given by $u = 2y - y^2$, where u is the velocity in m/sec at a distance of y metre above the plate. Determine the velocity gradient and shear stress at the boundary and 1.5 m from it. Dynamic viscosity of the fluid is 0.9 Ns/m^2. (16)

Or

(b) In a two dimensional incompressible flow the fluid velocities are given by $u = x - 4y$ and $u = -y - 4x$. Show that velocity potential exists and determine its form. Find also the stream function. (16)

12. (a) Derive Euler's equation and Bernoulli's energy equation. (16)

Or

(b) List out the assumptions involved in Euler's equation of motion. Derive the Bernoulli equation from Euler's equation in the case of incompressible flow. (16)

13. (a) Discuss the various Dimensional Parameters with its application. (16)

Or

(b) Explain the step by step procedure for solving dimensional homogeneity using Buckingham π Theorem. (16)

14. (a) Explain in detail about Impulse turbine and Reaction turbine with a sketch. (16)

Or

(b) Discuss the various performance curves for pumps and turbines. (16)

15. (a) Explain in detail about the Radial flow, axial flow and mixed flow pumps along with the performance calculation. (16)

Or

(b) With a neat sketch explain the working of a torque converter. (16)