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Question Paper Code: 33704

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. Differentiate between steady and unsteady flow.
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. Define: (i) Euler number (ii) Mach number.
7. State the momentum equation. When can it be applied?
8. What is Cavitation?
9. What do you mean by Positive Displacement Machines?
10. What is the use of Indicator Diagrams?

PART - B (5 x 16 = 80 Marks)

11. (a) Discuss the properties of fluids and Types of flow? (16)

Or

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

12. (a) Derive Bernoulli's equation by considering the motion of fluid elements along the streamline and state the assumptions made in the derivation. (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) The efficiency η of a fan depends on density ρ , dynamic viscosity μ of the fluid, angular velocity ω , diameter D of the rotor and the discharge Q . Express the efficiency η in terms of dimensionless parameter. (16)

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

Or

(b) (i) What is axial flow turbine? Name the types of axial flow turbine. (4)

(ii) Explain about the axial flow reaction turbine with neat sketch. (8)

(iii) Give the importance points to be remembered for an axial flow turbine. (4)

15. (a) (i) Explain the construction and working of a single acting reciprocating pump with air vessels fitted. (8)

(ii) Sketch the various types of indicator diagrams of a reciprocating pump. (8)

Or

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