R-15

Code: 5G542

II B.Tech. II Semester Supplementary Examinations November 2023
Fluid Mechanics and Hydraulic Machinery
(Mechanical Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	BL

UNIT–I

| 1. | A pipe containing an oil of specific gravity 0.9. A differential manometer connected at the two points A and B shows a difference in mercury level as 15cm. Find the difference of pressure at the two points. | 14M | CO1 | L2 |

OR

| 2. a) | What are the important fluid properties? Write their units? | 7M | CO1 | L1 |
| b) | Distinguish between simple manometer and a differential manometer. | 7M | CO1 | L2 |

UNIT–II

| 3. | A horizontal venturimeter with inlet and throat diameters 30 cm and 15 cm respectively is used to measure the flow of water. The reading of differential manometer connected to the inlet and throat is 20 cm of mercury. Determine the rate of flow. Take Cd=0.98. | 14M | CO2 | L3 |

OR

| 4. | Derive the Euler's equation of motion along a streamline | 14M | CO2 | L2 |

UNIT–III

| 5. | Derive an expression for the force exerted by a jet striking the curved plate at one end tangentially when the plate is symmetrical. | 14M | CO3 | L2 |

OR

| 6. | A jet of water if diameter 75mm moving with a velocity 25m/s strikes a fixed plate in such a wat that the angle between the jet and plate is 60^0. Find the force exerted by the jet on the plate i) In the direction normal to the plate and ii) In the direction of the jet. | 14M | CO3 | L3 |

UNIT–IV

| 7. | A Pelton wheel turbine develops 9000 Kw under a head of 300m. The turbine speed is 550 rpm and ratio of jet dia to wheel dia is 1/10. The hydraulic, volumetric and mechanical efficiencies are 0.98, 0.95 and 0.92 respectively. The speed ratio is 0.46 and coefficient of velocity is 0.98. Calculate the no of jets. | 14M | CO4 | L3 |

OR

| 8. | Explain the different types of the Efficiencies of a turbine. | 14M | CO4 | L2 |

UNIT–V

| 9. | The following details refer to working of a single acting reciprocating pump. Find the slip, coefficient of discharge and theoretical power required to drive the pump. Piston diameter = 15 cm, Crank radius = 15 cm, Diameter of delivery pipe = 10 cm, Discharge of the pump = 0.31 m3 /min. Total lift=15m, Speed of the pump = 60 rpm. | 14M | CO5 | L3 |

OR

| 10. | What are the equations for work done and discharge of a reciprocating pump? Define the slip and coefficient of discharge of a reciprocating pump. | 14M | CO5 | L2 |

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