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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations March-2021

FLUID MECHANICS & HYDRAULIC MACHINERY

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

- 1 a Explain how you would find the resultant pressure on a curved surface immersed in the liquid. **6M**
b Define centre of pressure and derive an expression for centre of pressure for a vertically submerged surface. **6M**

OR

- 2 a How does viscosity of a fluid vary with temperature? **6M**
b What are different types of Mechanical Pressure Gauges? Explain briefly about Bourdon's Pressure Gauge? **6M**

UNIT-II

- 3 Obtain an expression for continuity equation for a one & three - dimensional flow. **12M**

OR

- 4 a What is Euler's equation of motion? How do you obtain Bernoulli's equation from it? Name the different forces present in a fluid flow. **6M**
b State Bernoulli's theorem for steady flow of an incompressible fluid. Derive the expression for Bernoulli's theorem from first principle and state the assumption made for such a derivation. **6M**

UNIT-III

- 5 a Derive the expression for flow through pipes in series. **6M**
b Derive the expression for flow through parallel pipes. **6M**

OR

- 6 a Explain pitot tube and pitot static tube. **6M**
b A sub-marine moves horizontally on a sea and has its axis 15m below the surface of water. A pitot tube properly placed just in front of a sub-marine and along its axis is connected to two limbs of a u - tube containing mercury. The difference of mercury level is found to be 170mm find the speed of the sub-marine knowing that the specific gravity of mercury is 13.6 and that of sea water is 1.026 with respect of fresh water. **6M**

UNIT-IV

- 7 Write a note on a) Euler's model law b) Weber model law c) Mach model law. **12M**

OR

- 8 a Describe briefly Buckingham's pi- theorem. **6M**
b The time period (t) of a pendulum depends upon the length (l) of the pendulum and acceleration due to gravity (g). Derive expression for time period. **6M**

UNIT-V

- 9 a What is pelton turbine and discuss the parts of pelton turbine? **6M**
b Derive the expression for velocity triangles and work done for pelton wheel. **6M**

OR

10 A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 r.p.m. The vanes of curved back to an angle of 30° with the periphery. The impeller diameter is 300mm and outlet width is 50mm. Determine the discharge of the pump if manometric efficiency is 95%. 12M

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