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181741/171741/121741/031741/
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**4th Sem. Branch : Auto, Mech (3rd/4th) Prod (3rd), T&D (3rd) GE,
CNC, Adv. Manuf. Tech., Mechnatronics, CAD/CAM, Mech Engg.
(Fabrication Tech.) Mech Engg. (CAD/CAM Dsgn & Robotics)
Sub : Hydraulics & Pneumatics/Hyd. & Hyd. M/c**

Time : 3 Hrs.

M.M. : 100

SECTION-A

Note: Multiple type Questions. All Questions are compulsory. (10x1=10)

Q.1 An ideal fluid is

- a) Frictionless and incompressible
- b) Very viscous
- c) Incompressible
- d) None of these

Q.2 Surface tension of liquid

- a) Increases with area
- b) decreases with temperature
- c) Increases with temperature
- d) Decreases with area

Q.3 As a pressure head the atmospheric pressure is

- a) 1.033 m of water
- b) 10.3 m of water
- c) 7.6 m of water
- d) 76 m of water

Q.4 Pitot tube is used to measure

- a) Discharge
- b) Velocity at a point
- c) Density
- d) Pressure

Q.5 Hydraulic gradient line is always
a) Below the total energy line
b) Above the total energy line
c) Parallel to bottom
d) None of the above

Q.6 In a reaction turbine, water at inlet possesses.
a) Only pressure energy
b) Only kinetic energy
c) Both pressure and kinematic energy
d) None of the above

Q.7 Piezometer measures

- a) Gauge Pressure
- b) Absolute pressure
- c) Vacuum pressure
- d) None of the above

Q.8 Bernoulli's equation is applicable to

- a) Steady flow
- b) Unsteady flow
- c) Both A & B
- d) None of these

Q.9 Bernoulli's theorem deals with the law of conservation of
a) Mass

- b) Energy
- c) Momentum
- d) None of the above

Q.10 The hydraulic ram performs the function of

- a) To lift small quantity of water through a greater height
- b) To lift quantity of water through a shorter height
- c) Both A & B
- d) None of these

(1) 181741/171741/121741/
031741/117243/121841/
031841/072442

(2) 181741/171741/121741/
031741/117243/121841/
031841/072442

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

- Q.11 Define Specific volume.
Q.12 Define Pressure.
Q.13 What is turbulent flow.
Q.14 What is pitot tube.
Q.15 Write Continuity equation.
Q.16 The branch of engineering science which deals with water at rest is called _____.
Q.17 The viscosity of liquids _____ with increase in temperature.
Q.18 Define viscosity.
Q.19 Venturimeter measures flow on the application of Bernoulli's theorem. (True/False)
Q.20 Draft tube is used in an impulse turbine. (True/False)

SECTION-C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen Questions. (12x5=60)

- Q.21 Explain different types of flow.
Q.22 Write short note on working of venturimeter.
Q.23 Explain Darcy - Weisbach formula for calculating head loss in pipes.
Q.24 Write short note on velocity of liquid flow through nozzles.
Q.25 What is a fluid and how are these classified.

Q.26 Define the following terms.

- a) Mass Density b) Specific weight
c) Capillarity
- Q.27 If the mass density of a fluid is 790kg/m^3 . Determine its specific weight and specific volume.
- Q.28 The right limb of a simple U-tube manometer containing mercury is open to atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.85 is flowing. The centre of the pipe is 15cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 25cm.
- Q.29 Differentiate between impulse and reaction turbine.
- Q.30 Explain the working of Vane Pump.
- Q.31 Explain the principle and working of Francis turbine.
- Q.32 Name various minor losses in pipes.
- Q.33 Define laminar and turbulent flow with examples.
- Q.34 What do you mean by rate of flow? What is its SI Unit.
- Q.35 Explain the Basic components of a Hydraulic system.

SECTION-D

Note: Long answer questions. Attempt any two questions out of three Questions. (2x10=20)

- Q.36 Write short note on
i) Hydraulic Press ii) Hydraulic Jack
- Q.37 Explain the construction and working of pelton wheel turbine with neat sketch.
- Q.38 State and explain Bernoulli's Theorems. Write its assumptions, limitations and applications.

(3)

181741/171741/121741/
031741/117243/121841/
031841/072442

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181741/171741/121741/
031741/117243/121841/
031841/072442