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4th Sem / Branch : Auto, Mech (3rd/4th) Prod (3rd), T & D (3rd), GE, CNC,Adv. Manuf. Tech., Mechatronics, CAD/CAM, Mech Engg (Fabrication Tech) Mech Engg. (CAD/CAM Design & Robotics
Sub.: Hydraulics and Pneumatics/Hyd. & Hyd. M/c

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 The fluid which has no viscosity, no surface tension and no compressibility

a) Ideal fluid b) Real fluid
c) Newtonian fluid d) Non newtonian fluid

Q.2 The specific weight of water is

a) 1000 N/m^3 b) 9810 N/m^3
c) 9.81 N/m^3 d) 1000 Kg/m^3

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 Continuity equation deals with the law of conservation of

a) Mass b) Energy
c) Momentum d) None of the above

Q.5 Pitot tube is used to measure

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

Q.6 The inlet length of venturimeter is _____ the outlet length

a) Equal to b) More than
c) Less than d) Any of the above

Q.7 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.8 Hydrualic ram works on the principle of

a) Centrifugal action b) Water hammer
c) Bernoullis theorem d) Reciprocating action

Q.9 For small discharge at high pressure _____ pump is preferred

a) Centrifugal pump b) Axial flow pump
c) Propeller pump d) Reciprocating pump

Q.10 In a reaction turbine, water at inlet possesses

a) Only pressure energy
b) Only kinetic energy
c) Both pressure and kinetic energy
d) None of the above

SECTION-B

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

Q.11 Weight density = _____/_____?

Q.12 Define specific volume.

Q.13 Define surface tension.

Q.14 What is pressure?

Q.15 Define manometers.

Q.16 What is a turbulent flow?

Q.17 Express continuity equation.

Q.18 Define total head.

Q.19 What is a pitot tube?

Q.20 What is hydraulic mean depth?

SECTION-C

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

Q.21 Explain Pascal's law and its application.

Q.22 Explain different types of flow.

Q.23 Write short note on Bourdan's pressure guage.

Q.24 What are major losses?

Q.25 Write short note on working of venturimeter.

Q.26 What are limitation of Bernoulli's theorem?

Q.27 A pipe 12.5 cm in diameter is used to transport oil of sp. Gravity 0.75 under a pressure of 1 bar. If the total head is 20m relative to a datum plane which is 2.5 m below the centre of the pipe find discharge.

Q.28 Write note on velocity of liquid flow through nozzles.

Q.29 Derive an expression for specific speed?

Q.30 Write short note on hydraulic jack.

Q.31 Differentiate between impulse and reaction turbine.

Q.32 Write short note on vane pump.

Q.33 Drive relation between mass density and sp weight.

Q.34 If 3.7 m 3 of an oil weighs 34.25 kN, find its specific weight mass density and relative density.

Q.35 Write about two basic components of pneumatic systems.

SECTION-D

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

Q.36 Explain all minor pipes losses.

Q.37 Write short note on :

a) Hydraulic ram

b) Hydraulic door closer

Q.38 A U-tube differential manometer containing mercury (sp gr 13.6) connect pipes A & B, pipe A carries carbon tetra chloride of specific gravity 1.55 under pressure 12N/cm2 pipe B carries liquid of sp. Gravity 0.85 under pressure 20N/cm2. Pipe A is higher than pipe B by 2.2 m. The mercury level falls 20 cm below centre line of pipe B. Determine the difference in mercury level.