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3rd Sem / Civil, Brick Tech, Const mgmt, Highway Engg

Subject:- Fluid Mechanics

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 Fluid is a substance, which offers no resistance to.(CO1)
a) Pressure b) Shape
c) Temperature d) All the above

Q.2 Which of the following is dimension less? (CO2)
a) Specific weight b) Specific volume
c) surface tension force d) specific gravity

Q.3 The centre of pressure acts _____are centre of gravity of the immersed surface. (CO3)
a) at b) below
c) above d) can't say

Q.4 A u-tube differential manometer measures. (CO4)
a) absolute pressure at a point
b) Local atmospheric pressure
c) Difference in total energy between two points
d) Difference in pressure between two points

Q.5 The path followed by a fluid particle mm, te is called a (CO5)
a) Stream line b) Path line
c) Streak line d) None of these

Q.6 The function of an orifice is (CO6)
a) To measure discharge through a pipeline
b) To measure discharge through a canal
c) To measure discharge from a tank
d) To measure velocity of flow.

Q.7 An opening provided in the side of a tank or vessel such that the liquid surface in the tank is below the top edge of the opening is known as (CO6)
a) Weir b) Notch
c) Orifice d) None of these

Q.8 Head lost in friction is governed by (CO7)
a) Froude,s law b) Darcy's law
c) Chezy's law d) None of these

Q.9 Hydraulic mean depth of a Trapezoidal channel of most economical cross-section is given by
a) d/2 b) 2/d
c) 3d/2 d) None of these

Q.10 A pump is a device which converts (CO9)
a) Mechanical energy into Hydraulic energy.
b) Hydraulic energy into mechanical energy
c) Electrical energy into mechanical energy
d) All of the above

SECTION-B

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

Q.11 Ideal fluids are also known as _____. (CO1)

Q.12 Hydraulic press is the practical application of the _____law (CO3)

Q.13 A piezometer tube is not suitable for measuring _____ pressure. (CO4)

Q.14 Continuity equation of flow is based on the principle of _____. (CO5)

Q.15 The point where maximum _____ of jet leaving an orifice take place is known as _____. (CO6)

Q.16 Pitot tube is used for measurement of_____. (CO6)

Q.17 In pipe flow , maximum velocity occurs at the _____ of pipe section . (CO7)

Q.18 Chezy's formula is given by _____. (CO8)

Q.19 The rotating part of a centrifugal pump is called _____. (CO9)

Q.20 Air compressor is machine used to compress air and to raise its _____. (CO9)

SECTION-C

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

Q.21 Explain co-efficient of viscosity and give its units . Discuss the effect of temperature and pressure on viscosity. (CO1)

Q.22 A circular plate 5mx5m hangs in water from one of its corners. The centre of gravity of the plate is at a depth of 10m from the water surface. find the total pressure and depth of centre of pressure. (CO3)

Q.23 Explain bramah's hydraulic press. Derive its mechanical advantage. (CO3)

Q.24 One limb of a u-tube containing mercury is attached to a pipe carrying water under pressure of 1.7 bar . if the mercury level rise up in the free limb by y meter above its level in the other limb, find out the value of y if the center line of the pipe is 1.5 meter above top level of mercury in the free limb (CO4)

Q.25 State Bernoullis theorem for flow Liquids and name some practical application of Bernoulli theorem. (CO5)

Q.26 Define venacontracta . Why it has got the smallest section of the jet. (CO7)

Q.27 A weir 300 meter long is discharging water under head of 1.25 meter , calaclate the discharge over the weir by using (CO6)

a) Bazin's formula b) Francis formula

Q.28 What do you understand by current meter. (CO8)

Q.29 Distinguish between hydraulic gradient line and total energy line (CO7)

Q.30 Define an economical section hydraulic mean depth and wetted perimeter . (CO8)

Q.31 What are the common defects in centrifugal pump and how are they rectified ? (CO9)

Q.32 What is meant by knocking in pipes. (CO7)

Q.33 Explain minor head losses and various minor head losses. (CO7)

Q.34 Write short note on dead weight pressure guage. (CO4)

Q.35 The barometric pressure at sea level is 760 mm of mercury and that on mountain is 735 mm of mercury if the specific weight of air is assumed constant as 12 n/m^3 , what is the elevation of the mountain top ? (CO4)

SECTION-D

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

Q.36 A horizontal venturimeter with inlet and throat diameters 300 mm and 150 mm respectively is used to measure the flow of water. The reading of differential manometer connected to inlet and throat is 200 mm of mercury Determine the rate of flow Take Cd=0.98 . (CO6)

Q.37 Explain surge tank and syphon. (CO8)

Q.38 Water is flowing though a non-uniform pipe gradually tapering from 0.15 metre diameter to 0.08 meter diameter. If the average velocity of water at section 0.15 metre diameter is found to be equal to 1.5 m/s. Find out the discharge in litre per second and also the velocity of flow at 0.08 metre diameter section. (CO5)