

- b) Dynamic viscosity
- c) Discharge
- d) Angular Acceleration

- Q.21 A rectangular channel 6.0 m wide is having a bed slope of 1:1000. If the depth of water is 2.0m, find the mean velocity of flow and the discharge. Assuming Chezy's constant, $C=60$
- Q.22 Write a short note on "Reciprocating Pumps".

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

- Q.23 a) State the pascal's law and write the applications of Pascal's law.
- b) Draw the diagram and write the expression to find out the total pressure on a vertically immersed plane trapezoidal surface in a liquid.
- Q.24 a) A rectangular channel 3.5 m wide is provided with a venturimeter of 1.6 m wide throat. Find the quantity of water flowing through the venturimeter. When the depth of water into upstream side is 1.75 m and that at the throat is 1.30m. Take coefficient of venturimeter as 1.0
- b) Write the properties of the most economical rectangular channel section along with diagram.
- Q.25 Two pipes of length of 1 km each and of 350 mm and 450 mm respectively are connected in parallel between two reservoirs. Find the ratio of their discharges, if the value of coefficients of friction is same for both the pipes.

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3rd Sem / Civil, Brick Tech, Const Mgmt, Highway Engg.

Subject : Fluid Mechanics

Time : 3 Hrs.

M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

- Q.1 The resultant of hydrostatic force acts through a point known as _____
- a) Centre of pressure b) Centre of gravity
 - c) Centre of buoyancy d) None of these
- Q.2 The conditions of stable equilibrium for a floating body is _____
- a) The meta-centre M coincides with the centre of gravity G
 - b) The meta-centre M is below the centre of gravity G
 - c) The centre of buoyancy B is above the centre of gravity G
 - d) The meta -centre M is above the centre of gravity G
- Q.3 Notch is device used for measuring _____
- a) Rate of flow through a small channel
 - b) Rate of flow through pipes
 - c) Velocity through a pipe
 - d) Velocity through a small channel

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- Q.4 When the pipes are connected in series, the total rate of flow _____
- Is the same as flowing through each pipe
 - Is equal to the sum of the rate of flow in each pipe
 - Is equal to the reciprocal of the sum of the rate of flow in each pipe
 - None of the above
- Q.5 If the Froude number in open channel flow is more than 1.0, the flow is called _____ (CO8)
- Streaming flow
 - Shooting flow
 - Critical flow
 - None of these
- Q.6 The discharge through a trapezoidal channel is maximum when _____
- Top width = half of sloping side
 - Top width = 1.5 X sloping side
 - Half of top width = Sloping side
 - None of these

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 Hydrostatic pressure variation implies that the pressure varies linearly with _____ (Area / Depth)
- Q.8 Define the term "Centre of Buoyancy".
- Q.9 Bernoulli's theorem deals with the law of conservation of _____ (Energy / Mass)
- Q.10 Define the term "Weir".
- Q.11 Dimensional analysis is the method of dimensions, in which _____ are M, L and T. (Fundamentals dimensions / Derived dimensions)

- Q.12 Chezy's formula is given as _____ ($V = m \sqrt{C_i}$ / $V = C \sqrt{m_i}$)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

- Q.13 Describe the effect of temperature on viscosity of a fluid.
- Q.14 The surface tension of water in contact with air at 20°C is 0.0725 N/m. The pressure inside a droplet of water is to be 0.02 N/cm² greater than the outside pressure. Calculate the diameter of the droplet of water.
- Q.15 A differential manometer connected at the two points A and B in a pipe containing an oil of specific gravity 0.80, shows a difference in mercury levels as 20 mm. Determine the difference in pressure at the two points in terms of head of water.
- Q.16 A rectangular plate 5 m long and 3 m wide is immersed vertically in water in such a way that its 5 m side is parallel to the water surface and is 1.5 m below it. Determine the total pressure on the plate.
- Q.17 Describe the conditions of equilibrium for the stability of a floating body.
- Q.18 The rate of flow through a pipe A-B is 500 liters/Sec . The diameter at end A is 25 cm and velocity at end B is 3.5 m/s. Determine the velocity an end A and diameter of pipe at end B.
- Q.19 State the bernoulli's theorem and write any two applications of it.
- Q.20 Determine the dimensions of the following quantities.
- Specific weight