IMPORTANT QUESTIONS

UNIT- I

Short :

1. Explain Hydrostatic law? (march-2017)
2. Explain vaccum pressure? (march-2017)
3. what is vapour pressure? Explain? (nov-2016)
4 .list out the different fluid properties along with their significance? (nov-2016)
5. write the dimension of surface tension & vapour pressure in MLT system?(March-2016)

Long:

1.Define newton law of viscosity.Explain the importance of viscocity in fluid motion?(march-2016, nov-2016)
2.An oil of viscosity 5 poise is used for lubrication between a shaft and sleeve. The diameter of shaft is 0.5m and it rotates at 200 rpm. Calculate the power lost in the oil for a sleeve length of 100mm. The thicknes of oil film is 1.0m?(nov-2016)
3.Derive an expression of centre of pressure of an inclined surface immersed in a liquid?(Nov-2016, march-2016)
4.Define total and centre of pressure?(march-2017)
5.Define atmospheric, gauge, vaccum, absolute pressure?(March-2017)

Objective Questions:

1. If the atmospheric pressure on the surface of an oil tank (sp. gr. 0.8) is 0.1 kg/cm^2, the pressure at a depth of 2.5 m, is

A. 1 metre of water

B. 2 metres of water

C. 3 metres of water

D. 3.5 metres of water

E. 4.0 metres of water.

2.The maximum vacuum created at the summit of a syphon is

A. 2.7 m of water

B. 7.4 m of water

C. 5.5 m of water

D. none.

3.The total pressure force on a plane area is equal to the area multiplied by the intensity of pressure at its centroid, if

A. area is horizontal

B. area is vertical

C. area is inclined

D. all the above.

4.If the volume of a liquid weighing 3000 kg is 4 cubic metres, 0.75 is its

A. specific weight

B. specific mass

C. specific gravity

D. none of these.

5.Unit of kinematic viscosity is

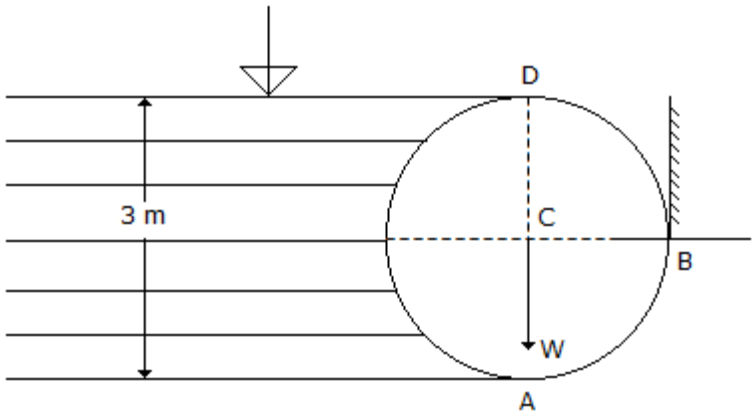
A. m^2/sec

B. Newton sec/m^2

C. Newton sec/m^3

D. Kg sec/m^2.

6. A cylinder 3 m in diameter and 4 m long retains water one side as shown in the below figure. If the weight of the cylinder is 2000 kgf, the horizontal reaction at *B* is



7. When two layers of a fluid separated by *dy* move over the other with a difference of velocity *dv*, causes a shearing stress $\tau = \mu \frac{dv}{dy}$, where μ is known as

A. coefficient of viscosity

A. 10,000 kgf

B. 15,000 kgf

C. 20,000 kgf

D. 18,000 kgf.

B. absolute viscosity

C. dynamic viscosity

D. viscosity

E. all the above.

8. An ideal flow of a liquid obeys

A. Continuity equation

B. Newton's law of viscosity

C. Newton's second law of motion

D. dynamic viscosity law,

9. Differential manometers are used to measure

A. pressure in water channels, pipes, etc.

B. difference in pressure at two points

C. atmospheric pressure

D. very low pressure.

10. Liquids

A. cannot be compressed

B. do not occupy definite shape

C. are not affected by change in pressure and temperature

D. none of these.

UNIT- II

Short:

1.Explain Path line, stream tube?(march-2016)
2.What do you understand by rotational& irrotational flows? (march-2016)
3.What do you mean 1D,2D,3D flows?(nov-2016)
4.Distinguish fluid statics, kinematics, dynamics(nov-2016)
5.Explain stream and velocity potential functions?(march-2017)

Long:

1.Describe in detail the classification of flows given one example in each category?(march-2017, Nov-2016)
2.The velocity potential components in 2D flow in a field of incompressible fluid are expressed u=x-3y. Obtain for stream function and velocity potential.?(Mar-2016)
3.What do you mean by equipotential line And a line of constant stream function? (march-2016)

4.Define steam line, Path line, streak line. Derive the mathematical expressions for each of these lines?(Nov-2016)
5. A 30 cm diameter pipe carries oil of sp. gr. 0.8 at a velocity of 2 m/s. At another section the diameter is 20 cm. Find the velocity at this section and also mass rate of flow of oil. (November 2016)

Objective Questions:

1.When a body is totally or partially immersed in a fluid, it is buoyed up by a force equal to

A. weight of the body

B. weight of the fluid displaced by the body

C. weight of the body and fluild displaced by the body

D. difference of weights of the fluid displaced and that of the body

E. none of these.

2. In fluids, steady flow occurs when

A. conditions of flow change steadily with time

B. conditions of flow do not change with time at a point

C. conditions of flow remain the same at adjacent point

D. velocity vector remains constant at a point.

3. An ideal fluid

A. is frictionless and incompressible

B. obeys Newton's law of velocity

C. is similar to gas

D. is very viscous.

4. For uniform flow in canals

A. there is a balance between the frictional loss and drop in elevation of the channel

B. bed and free water surfaces of a channel are parallel to each other

C. bed of channel represents the hydraulic gradient

D. all the above

5. In one dimensional flow, the flow

A. is steady and uniform

B. takes place in straight line

C. takes place in curve

D. takes place in one direction

6. The centre of gravity of the volume of the liquid displaced is called

A. centre of pressure

B. centre of buoyancy

C. metacentre

D. none of these

7.The body will sink down if the force of buoyancy is _____ the weight of the liquid displaced.

A. equal to

B. less than

C. more than

8. If a body floating in a liquid returns back to its original position, when given a small angular displacement, the body is said to be in

A. neutral equilibrium

B. stable equilibrium

C. unstable equilibrium

D. none of these

9. The metacentric heights of two floating bodies A and B are 1 m and 1.5 m respectively. Select the correct statement.

A. The bodies A and B have equal stability

B. The body A is more stable than body B

C. The body B is more stable than body A

D. The bodies A and B are unstable

10. The flow of water through the hole in the bottom of a wash basin is an example of

A. steady flow

B. uniform flow

C. free vortex

D. forced vortex

UNIT- III

Short :

1. Distinguish Notch, Weir?(Nov-2016)
2. Explain Navier stroke equation?(Nov-2016)
3.Write down the disadvantages of orifice meter?(Mar-2017)
4.List out the Assumptions of Euler's Equation of motion?(Mar-2017)
5.What are the advantages of Triangular notch over rectangular notch?(mar-2016)
6.State the assumptions bernoullis Equation?(mar-2016)

Long:

1. Integarte 3D eulers equations for steady flow Condition and prove that each one of them Yields Bernoullis equation?(Nov-2016)
2.A pipe of diameter 200mm, conveys a discharge of 2250 litre of water per minute and has apressure of 15.70 Kpa at a certain section. Find the total energy head with respect to a datumn of 5m below the pipe? (Nov-2016)
3. Discuss in detail classification of orifices and notches?(mar-2017)
4. A rectangular notch 50 cm long is used to measuring a discharge 40 litres per second. An error of 2mm was made in measuring the head over the notch. Calculate the percentage error in the discharge. Take Cd=0.6?(mar-2016)
5.Differentiate between:
   a. Bernoullis equation and Eulers equation?
   b. Velocity head and Pressure head?
   c. Energy Equation and momentum Equation?(Nov-2016)

Objective Questions:

1. A pitot tube is used to measure

   A. pressure

   B. difference in pressure

   C. velocity of flow

   D. none of these.

2.The thickness of a sharp crested weir is kept less than

   A. one-third of the height of water on the sill

   B. one-half of the height of water on the sill

   C. one-fourth of the height of water on the sill

   D. two-third of the height of water on the sill

   E. none of these.

3. Bernoulli's equation assumes that

   A. fluid is non-viscous

   B. fluid is homogeneous

   C. flow is steady

   D. flow is along the stream line

   E. all the above.

4. While applying the Bernoulli's equation $\left[\frac{p}{\omega} + Z + \frac{v^2}{2g}\right]_{\text{any section}}$ = total head, the work any section done on the flow system, if any

   A. is added on the right side of the equation

   B. is added on the left side of the equation

   C. is ignored

   D. none of these.

5.Euler's equation for motion of liquids, is given by

   A. $\frac{dp}{\rho} - gdz + vdv = 0$

B. $\frac{dp}{\rho} + dgz - vdv = 0$

C. $\frac{dp}{\rho} + gdz + vdv = 0$

D. $\rho dp + gdz + vdv = 0$

6. The thickness of a sharp crested weir is kept less than

A. one-third of the height of water on the sill

B. one-half of the height of water on the sill

C. one-fourth of the height of water on the sill

D. two-third of the height of water on the sill

E. none of these.

7. The most familiar form of Bernoulli's equation, is

A. $\frac{P_1}{\omega} + Z_1 + \frac{{v_1}^2}{2g} = \frac{P_2}{\omega} + Z_2 + \frac{{v_2}^2}{2g}$

B. $\frac{dp}{\rho} + g \,.\, dz + vdv = 0$

C. $\left[\frac{p}{\omega} + Z + \frac{v^2}{2g}\right]$ any section = constant head

D. none of these.

8. A triangular notch is preferred to a rectangular notch because

A. only one reading is required

B. its formula is simple to remember

C. it gives more accurate results for low discharge

D. it measures a wide range of flows accurately

E. all the above.

9. The discharge over a right angled notch is (where H = Height of liquid above the apex of notch)

A. $\frac{8}{15} C_d \sqrt{2g} \times H$

B. $\frac{8}{15} C_d \sqrt{2g} \times H^{3/2}$

C. $\frac{8}{15} C_d \sqrt{2g} \times H^{2}$

D. $\frac{8}{15} C_d \sqrt{2g} \times H^{5/2}$

10. A weir is said to be broad crested weir, if the width of the crest of the weir is _____ half the height of water above the weir crest.

A. equal to.

B. less than

C. more thaN

UNIT- IV

Short:

1.Explain Reynolds number?(nov-2016,mar-2016)
2.Campare the velocity profiles for laminar and turbulent flows?(nov-2016)
3.List the charecteristics of turbulent flow?(mar-2017)
4.Explain TEL?(mar-2017)
5.Write the expression loss due to sudden expansion & contraction of pipe?((mar-2016,mar-2016,mar2017)
6.Define TEL,HGL?(mar-2016,mar 2017)

Long:

1.Write a note on: Pipes in series& moodys chart?(mar-2016)
2.Find the diameter of the pipe length of 2534m when the rate of floe of water through the pipe 0.35m^3/s, and head loss due to friction is 4.5m, Take C=50 in chezys formula?(mar-2016)
3. Three pipes of 400 mm, 200 mm and 300 mm diameters have lengths of 400 m, 200 m and 300 m respectively. They are connected in series to make a compound pipe. The ends of this compound pipe are connected with two tanks whose difference of water levels is 16 m. If co-efficient of friction for these pipes is same and equal to 0.005, determine the discharge through the compound pipe neglecting first the minor losses and then including them. (Nov-2016)
4.Explain the terms Pipes in series, Equivalent pipe, Equivalent size of the pipe?(nov-2016)

Objective Questions:

1. A pipe of 0.1 m^2 cross sectional area suddenly enlarges to 0.3 m^2 cross-sectional area. If the discharge of the pipe is 0.3 m^3 /sec, the head loss is

   A. 2/*g* m of water

   B. *g*/2 m of water

   C. 1*g* m of water

   D. *g* m of water.

2. Reynold number is the ratio of initial force and

A. viscosity

B. elasticity

C. gravitational force

D. surface tension.

3. The length *AB* of a pipe *ABC* in which the liquid is flowing has diameter (d_1) and is suddenly enlarged to diameter (d_2) at *B* which is constant for the length *BC*. The loss of head due to sudden enlargement is

A. $\frac{(v_1 - v_2)^2}{g}$

B. $\frac{v_1^2 - v_2^2}{g}$

C. $\frac{(v_1 - v_2)^2}{2g}$

D. $\frac{v_1^2 - v_2^2}{2g}$

4. Coefficient of contraction is the ratio of

A. actual velocity of jet at vena contracta to the theoretical velocity

B. loss of head in the orifice to the head of water available at the exit of the orifice

C. actual discharge through an orifice to the theoretical discharge

D. area of jet at vena contracta to the area of orifice

5. In a free nappe,

A. the pressure below the nappe is atmospheric

B. the pressure below the nappe is negative

C. the pressure above the nappe is atmospheric

D. the pressure above the nappe is negative

6.The Reynold's number of a ship is _____ to its velocity and length.

A. directly proportional

B. inversely proportional

7. Which of the following is an example of laminar flow?

A. Under ground flow

B. Flow past tiny bodies

C. Flow of oil in measuring instruments

D. all of these

8. When the pipes are in series, the total head loss is equal to the sum of the head loss in each pipe.

A. Yes

B. No

9. The loss of head at entrance in a pipe is (where v = Velocity of liquid in the pipe)

A. $\frac{v^2}{2g}$

B. $\frac{0.5\ v^2}{2g}$

C. $\frac{0.375\ v^2}{2g}$

D. $\frac{0.75\ v^2}{2g}$

10. The continuity equation

A. is independent of the compressibility of the fluid.

B. is dependent upon the viscosity of the fluid.

C. represents the conservation of mass.

D. none of these.

UNIT- V

Short:
1.What is Vonkarman momentum integral?
2.Explain about boundary layer transition?
3.What is Magnus Effect?(mar-2017)
4.Write a brief note on Prandtl Contribution?(mar-2017)
5.Define momentum thickness?(mar-2016)
6. Classification boundary layer based on Reynolds number?(mar-2016)

Long:
1.Differentiate between Laminar boundary layer and turbulent boundary layer. What is laminar sub layer?(mar-2016)
2.Explain with a neat sketch the boundary layer characteristics, when a fluid is flowing over a plate?(mar-2016)
3.Define: laminar, turbulent, laminar sub layer, boundary layer thickness?(mar-2017)
4.How will you determined wheather a boundary layer flow is attached flow, Detached flow or on the verge separation?(mar-2017, nov-2016)
5. What conditions Should be satisfied for separation of boundary layer?Discuss Briefly the methods that can be used to prevent separation?(nov-2016).
6.Describe pressure drag and friction drag?(nov-2016)

Objective Questions:

1. In case of laminar flow through a circular pipe,

A. momentum correction factor is 1.33

B. energy correction factor is 2.00

C. both (a) and (b)

D. Neither (a) nor (b).

2. The velocity corresponding to Reynold number of 2800, is called

A. sub-sonic velocity

B. super-sonic velocity

C. lower critical velocity

D. higher critical velocity

3.The velocity at which the laminar flow stops, is known as

A. velocity of approach

B. lower critical velocity

C. higher critical velocity

D. none of these

4.One stoke is equal to

A. 10^{-2} m^2/s

B. 10^{-3} m^2/s

C. 10^{-4} m^2/s

D. 10^{-6} m^2/s

5.The displacement thickness of a boundary layer is

[A]. The distance to the point where $(v/V) = 0.99$

[B]. the distance where the velocity v is equal to the shear velocity $V*$ that is where $v = V*$

[C]. the distance by which the main flow is to be shifted from the boundary to maintain the continuity equation

[D]. one-half the actual thickness of the boundary layer

6. The separation of flow occurs when the hydrodynamic boundary layer thickness is reduced to zero.

[A]. Agree

[B]. Disagree

7. In fluid flow, the boundary layer separation can not occur

A. in case of boundaries experiencing form drag.

B. at points of abrupt changes in the flow directions.

C. in laminar flow.

D. none of these.

8. Velocity of liquid hydrocarbon fuels in a pipeline can not be measured by magnetic flowmeters, because their _____ is very low/small.

A. thermal conductivity

B. electrical conductivity

C. specific gravity

D. electrical resistivity

9. State vonkarman momentum integral equation ———————

10. what is an equipotential line ——————————