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## PROPERTIES OF FLUIDS

1.  Study of fluid in motion without considering the forces causing it

    : **Kinematics**

2.  Study of fluid in motion considering the forces causing it

    : **Dynamics**

3.  Mass density of water      : **1000kg/m³ or 1g/cc**

4.  Ratio of weight of fluid to its volume is called

    : **Weight density or Specific weight**

5.  Weight density of water      : **9810 N/m³**

6.  Reciprocal of mass density    : **Specific volume**

7.  Mass density of air         : **1.24 kg/m³**

8.  Specific gravity of mercury    : **13.6**

9.  Property of fluid which offers resistance to the movement of fluid

    : **Viscosity**

10. Unit of dynamic viscosity     : **Ns/m² or Pa.s**

11. Ratio of dynamic viscosity to the density of fluid

    : **Kinematic viscosity**

12. Unit of kinematic viscosity in CGS System

    : **Stokes or cm³/s**

13. 1 Stoke is equal to          : **$10^{-4}$ m²/s**

14. According to Newton's law of viscosity, shear strass is directly proportional to      : **Rate of shear strain or velocity gradient**

15. Tensile force acting on the surface of a fluid is called

    : **Surface tension**

16. Pressure inside a liquid droplet : **4σ/d**

17. Attraction between different types of molecules is called

    : **Adhesion**

18. As temperature increases, surface tension...

    : **Decreases**

**19.** The rise or fall of a liquid when it is partially immersed in the liquid
: **Capillarity**

**20.** Capillary rise occurs when      : A**dhesion is greater than cohesion**

**21.** Equation for capillary rise      : $\dfrac{4\sigma \, \text{Cos} \, \theta}{\gamma d}$

**22.** .............is the ratio of increase in pressure to the volumetric strain
: **Bulk Modulus**

**23.** ...........is the reciprocal of Bulk Modulus
: **Compressibility**

**24.** Dimensional formula for Dynamic viscosity
: $\mathbf{ML^{-1}T^{-1}}$

**25.** Capillary fall occurs when angle of contact is
: **Obtuse**

**26.** Unit of dynamic viscosity in CGS System
: **Poise or dyne.sec/cm²**

**27.** Poise is equal to      : **1/10 Ns/m²**

**28.** Fluid which is incompressible and has zero viscosity is called
: **Ideal fluid**

## FLUID PRESSIRE

1. 1 bar is equal to ...... Pascal : $10^5$

2. The Intensity of pressure in a static fluid is same in all directions is stated by : **Pascal's law**

3. The rate of increase of pressure in a vertically downward direction is proportional to : **Depth of fluid**

4. Hydraulic press works on the principle of : **Pascal's law**

5. Pressure which is measured with reference to absolute zero pressure
: **Absolute pressure**

6. Any pressure measured with reference to atmospheric pressure is called : **Gauge pressuure**

7. Negative gauge pressure is otherwise called : **Vacuum pressure**

8. Pressure measured in common pressure measuring instruments
: **Gauge pressure**

9. Pressure measured below atmospheric pressure : **Vacuum pressure**

10. Atmospheric pressure at sea level at 15 degree Celsius
: **760 mm of Hg/10.33m of $H_2O$/101.3 KN/m²**

11. Usually mercury is used as manometric fluid because of its
: **High specific gravity**

12. ........is used to find out the pressure at a point in a flowing fluid
: **Simple Manometer**

13. .......is used to find difference in pressure between two points in a pipe or pressure difference in two pipes : **Differential Manometer**

14. ............can be used to find vacuum pressure : **U tube manometer**

15. Lighter manometric fluids are used only for Inverted
: **U tube manometer**

16. ...... are mechanical devices used for measuring the pressure by balancing the fluid column by a spring or dead weight
: **Mechanical Gauge**

17. Diaphragm pressure gauges can measure pressure up to :**16 milli bar**

18. Commonly used pressure gauges used to measure medium to high pressure. : **Bourdons Pressure gauge**

19. Pressure gauges mainly used to measure absolute pressure
: **Bellows pressure gauge**

## BUOUYANCY AND FLOTATION

1.  The upward force exerted by the fluid on the body when immersed in it is called      : **Buoyant force**

2.  The point through which buoyant force is supposed to act
    : **Centre of buoyancy**

3.  Point about which a floating body starts oscillating when it is tilted by a small angle is called      : **Metacentre**

4.  ...... is a point at which the line of action of force of buoyancy will meet the normal axis of body when it is given by a small angular displacement      : **Metacentre**

5.  Distance between centre of gravity and metacentre  is called
    : **Metacentric height**

6.  Floating body will be in stable equilibrium condition if
    : **Metacentre is above centre of gravity**

7.  The point of application of total pressure in a body is called
    : **Centre of pressure**

8.  Total pressure always acts... to surface
    : **Normal**

9.  Depth of centre of pressure of a submerged rectangular plane (with depth h) with its longest edge Just touching the water level is
    : **2h/3**

10. I/V of a floating body is termed as
    : **Metacentric radius**

11. Metacentric height of an ocean going vessel usually ranges from
    : **30 cm to 1.2 m**

12. Buoyant force is equal to

    : **Weight of the volume of fluid displaced by the solid body**

13. A submerged body is in stable equilibrium, if the centre of gravity of body lies      : **Below centre of buoyancy**

14. When a block of ice floating in a container melts, the level of water in container......      : **Remains same**

## FLUID KINEMATICS

1.  Branch of fluid mechanics that studies properties of fluid in motion without considering the forces causing it
: **Kinematics**

2.  In method, a single fluid particle is considered and its properties throughout its motion is studied.
: **Lagrangian method**

3.  In method, a point is fixed and properties of fluid passing through that particular point is studied. : **Eulerian method**

4.  The flow in which flow properties doesn't change with respect to time is called              : **Steady flow**

5.  The flow in which flow properties doesn't change with respect to space is called              : **Uniform flow**

6.  The flow in which fluid particles moves in a well defined path is called              : **Laminar flow**

7.  Well defined path in which a Laminar flow takes place is called
: **Stream line**

8.  If the density of fluid is varying throughout the motion with respect to time              : **Compressible flow**

9.  Continuity equation is based on the principle of
: **Law of conservation of mass**

10. For deriving continuity equation, flows assumed to
: **Steady & Incompressible**

11. Quantity of fluid passing through a particular point per unit time is called              : **Discharge**

12. In vector form, continuity equation can be represented as
: $\nabla.\mathbf{V}= \mathbf{0}$

13. Rate of change of velocity with respect to time at a given point in a flow field              : **Local acceleration**

14. Rate of change of velocity due to change of position of fluid

particles in a flow field.      : **Convective Acceleration**

15. Total acceleration is the sum of
: **Local and Convective acceleration**

16. Total acceleration of fluid particle is otherwise called
: **Material acceleration or Substantial acceleration**

17. In steady flow, total acceleration is equal to
: **Convective acceleration (Local acceleration = 0)**

18. A scalar function whose negative derivative with respect to any direction gives fluid velocity in that direction
: **Potential function**

19. Line along which a potential function is constant is called
: **Equipotential line**

20. A scalar function whose partial derivative with respect to any direction will give velocity compoment perpendicular to that direction is called      : **Stream function**

21. Une along which stream function is constant is called
: **Stream line**

22. Product of slope of equipotential line and stream line is
: **-1**

23. Equipotential lines and stream lines always intersect
: **Orthogonally**

24. If potential function exists, then flow is said to be Irrotational

25. A grid formed by drawing a series of equipotential lines and stream lines is called      : **Flow net**

26. ................is defined as the flow of liquid along a curved
: **Vortex motion path**.

27. Flow of liquid inside the impeller of centrifugal pump is an example of      : **Forced vortex**

28. If no external torque is required for the vortex motion to take place, then it is called      : **Free vortex**

**29.** The path/ trajectory followed by a certain fluid particle is called
: **Path line**

**30.** A line drawn joining all the points that has previously passed through a certain common point is called
: **Streak line**

**31**. Path of smoke coming out of a chimney is an example of
: **Streak line**

**32**. Bundle of stream line constitute to form
: **Stream tube**

**33.** For a steady flow, stream line, streak line and path line
: **Coincide**

**34.** Row along a closed curve is called
: **Circulation**

**35.** ............is the line integral of the velocity field in a closed curve.
: **Circulation**

**36**. ............ is the measure of rotation of fluid elements as it moves through the flow. : **Vorticity**

**37**. Ratio of circulation to its area is called
: **Vorticity**

**38**. The flow coming from a point and moves radially outwards in all directions at uniform rate is called...
: **Source flow**

**39.** The flow which is radially Inwards and disappears is
: **Sink flow**

**40**. In free vortex flow, the stream lines are
**: Concentric circles**

## FLUID DYNAMICS

1.  Branch of fluid mechanics that studies properties of fluid in motion considering the forces causing it : **Dynamics**

2.  Which are the forces considered in deriving Eulers equation of motion?        : **Gravitational and Pressure force**

3.  Each term in Bernoulli's equation represents
           : **Energy per unit weight**

4.  Bernoulli's theorem is based on the principle of
           : **Law of conservation of energy**

5.  Examples for the application of Bernoulli's theorem
           : **Venturimeter, Orifice meter, Pitot tube**

6.  Venturimeter is used to find      : **Discharge or rate of flow**

7.  Diverging part of venturimeter have ..... times length as that of its converging part      : **3 to 5 times**

8.  Angle of convergence of venturimeter
           : **20 to 30 degree**

9.  Angle of divergence of venturimeter : **6 to 7 degree**

10. Diameter of throat is ...........times diameter of pipe
           : **1/3 to 1/2**

11. In orifice meter diameter of orifice is kept ....... times diameter of pipe.
           : **0.5**

12. Pitot tube is used to measure     : **Velocity of flow**

13. Coefficient of velocity of Pitot tube is in the range of : **0.9 to 0.95**

14. Coefficient of discharge for orificemeter : **0.6 to 0.7**

15. When a liquid passing over an immersed body, at a point the resultant velocity becomes zero. This point is called
           : **Stagnation point**

16. Nozzle meter and rotameter are used to measure
           : **Discharge through pipes**

17. Hot wire anemometer is used to measure
           : **Velocity of air and gas**

## FLOW THROUGH PIPES & JET

1. Impulse momentum equation is derived based on the principle of
   : **Law of conservation of Momentum**

2. Momentum correction factor for laminar flow through circular pipe is taken as
   : **1.33**

3. Force exerted by a water jet striking on a stationary vertical plane is
   : $\rho AV^2$

4. Linear momentum equation is based
   : **On Newton's second law**

5. Reynolds number is the ratio of Inertia force to : **Viscous force**

6. In Reynolds experiment, which dye is used to study the flow pattern
   : **Aniline**

7. For turbulent flow in smooth pipes, the head loss is proportional to n th power of velocity. What is the value of n?
   : **1.75 to 2.0**

8. Major head loss in pipe flow occurs due to
   : **Friction**

9. Equation commonly used to find out Head loss in pipes
   : **Darcy Weisbach equation**

10. Minor head loss due to sudden contraction can be calculated by using the formula
    : $\dfrac{0.5v^2}{2g}$

11. If the pressure heads at the different sections of the pipe are plotted to scale as vertical ordinates above the axis of pipe and all these points are joined by a straight line, a straight sloping line will be obtained known as
    : **Hydraulic Gradient Line**

12. Piezometric head is the sum of : **Pressure head and Datum head**

13. Difference between the ordinates of Total Energy line and Hydraulic Gradient line is equal to
    : **Velocity head**

14. Nozzle meter and rota meter are used to measure
    : **Discharge through pipes**

15. Equation for friction factor for laminar flow
    : **64/Re**

16. Chezy's formula is given by : $V = C\sqrt{mi}$