MARATHON CLASS

(FLUID MECHANICS-SSC-JE-PYQ)

Q: 1) For a fluid, the shear stress was found to be directly proportional to the rate of angular deformation. The fluid is classified as
A : Non-Newtonian fluid
B : Ideal fluid
C : Newtonian fluid
D : Thixotropic fluid

Q: 2) The characteristic of an ideal fluid is:
A : One which satisfies continuity equation.
B : One which flows with least friction.
C : One which obeys Newton's law of viscosity.
D : Frictioniess and incompressible.

Q: 3) With increase in temperature the viscosity of air and water varies as
A : Viscosity of air increases and viscosity of water decreases
B : Viscosity of air increases and viscosity of water increases
C : Viscosity of air decreases and viscosity of water decreases
D : Viscosity of air decreases and viscosity of water increases

Q: 4) Viscosity of a fluid with specific gravity 1.3 is measured to be 0.0034 Ns/m^2. Its kinematic viscosity, in m^2/s, is
A : 2.6×10^6
B : 4.4×10^6
C : 5.8×10^6
D : 7.2×10^6

Q: 5) When the adhesion between moiecules of a fluid is greater than adhesion between fluid and the glass, then the free level of fluid in glass tube dipped in the glass vessel will be......
A : Same as the surface of the fluid
B : Lower than the surface of the fluid
C : Higher than the surface of the fluid
D : Dependent on atmospheric pressure

Q: 6) Which of the following fluids can be classified as non-Newtonian?
A : Kerosence oil and Diesel oil
B : Human blood and Toothpaste
C : Diesel oil and water
D : Kerosence and water

Q: 7) Which one of the following pressure units represents the least pressure?
A : Millibar
B : mm of mercury
C : N/mm^2
D : Kgf/cm^2

Q: 8) Measurement of pressure difference between two points is, generally done by using:
A : Venturimeter.
B : Pitot tube.
C : Differential manometer.
D : None of the above.

Q: 9) For a gauge pressure of A of -10.89 kPa, what is the specific gravity of the gauge liquid B in the figure below:
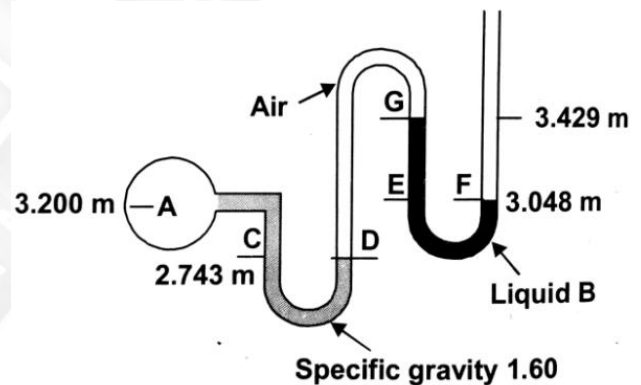
A : 1
B : 2
C : 3
D : None of these

Q: 10) Alcohol is used in manometer,because
A : Its vapor pressure is low
B : It provides suitable meniscus for the inclined tube
C : Its density is less
D : It provides longer length for a given pressure difference

Q: 11) At a certain point, the absolute pressure and atmospheric pressure is given by 850 mm of Hg and 700 mm of Hg respectively. What is the value of gauge pressure (mm of Hg) at that point?
A : 50
B : 100
C : 150
D : 200

Q: 12) The intensity of pressure at any point in the liquid at rest is same in all the directions. This statement is given by____.
A : Law of conservation of energy
B : Law of conservation of mass
C : Newton's law
D : Pascal's law

Q: 13) The rise of mercury in barometer is indicated as 80 mm. What is the atmospheric pressure (kN/m^2) at that point?
A : 80
B : 500
C : 10696
D : 15434

Q: 14) The rotation of a bucket containing water and rotation about its vertical axis at constant speed shall produce.
A : Free vortex
B : Forced vortex
C : Both of the above depending on the speed of rotation
D : None of the above

Q: 15) The centre of buoyancy always:
A : Coincides with the center of gravity.
B : Coincides with the centroid of the volume of fluid displayced.
C : Remains above the centre of gravity.
D : Remains below the centre of gravity

Q: 16) A floating body will remain in stable equilibrium if the metacenter is:
A : Above the centre of buoyancy.
B : Above the centre of gravity.
C : Below the centre of gravity.
D : Below the centre of buoyancy.

Q: 17) For stability of floating bodies, the metacentra should be
A : Above the center of gravity
B : Below the center of gravity
C : Above the centre of buoyancy
D : Below the centre of buoyancy

Q: 18) An odd shaped body weighing 7.5 kg and occupying 0.01 cubic metre volume will be completely submerged in a fluid having specific gravity of-
A : 1
B : 1.2
C : 0.8
D : 0.75

Q: 19) Metacentric height is given as the distance between____
A : The centre of gravity of the body and the metacentre
B : The centre of gravity of the body and the centre of buoyancy
C : The centre of gravity of the body and the centre of pressure
D : Centre of buoyancy and metacenter

Q: 20) Center of gravity of a thin hollow cone lines on the axis of symmetry at a height of
A : One half of the total height above base
B : One third of the total height above base
C : One-fourth of the total height above base
D : None of these

Q: 21) The line of action of the buoyant force acts through the centroid of the-
A : Submerged body
B : Volume of the floating body
C : Volume of the fluid vertically above the body
D : Displaced volume of fluid

Q: 22) A rectangular block of dimensions 2m×1m×1m is floating in the water with immersing depth is 0.5m. What is the weight of block (kN) if unit weight of water is 10 kN/cubic meter.
A : 5
B : 10
C : 15
D : 20

Q: 23) The stable equilibrium is achieved in the floating body when___.
A : Center of gravity is below the center of buoyancy.
B : Metacenter is above the center of gravity.
C : Metacenter is below the center of gravity.
D : Metacentric height is zero.

Q: 24) If the 90% volume of ice berg is immersed in the water and only 10% volume is above the water surface what is the density of the iceberg. The density of sea water is given as 1025 kg/m³?
A : 900 kg/m^3
B : 922.5 kg/m^3
C : 950 kg/m^3
D : 1000 kg/m^3

Q: 25) For a flow, the velocity components are given by $u=(\lambda xy^2-x^3y^2)$ and $v=(x^2y^2-3y^2)$. What is the value of λ for the possible flow field which includes steady incompressible flow?
A : 3
B : 5
C : 7
D : 9