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**Q : 1) A flow is said to be Sub-sonic Flow if the Mach number is.....**

**A : More than 1**

**B : Equal to 0**

**C : Equal to 1**

**D : Less than 1**



**Q : 2) The flow is said to be critical flow if Froude number is.....**

**A : Equal to 1**

**B : Equal to 0**

**C : Less than 1**

**D : More than 1**

**Q : 3) A fluid in which shear stress is more than the yield value and shear stress is proportional to the rate of shear strain is known as:**

**A : Newtonian Fluid**

**B : Ideal Fluid**

**C : Real Fluid**

**D : Ideal Plastic Fluid**

**Q : 4) For pseudoplastic non-Newtonian fluids, the apparent viscosity**

**A : increases with increasing deformation rate**

**B : decreases with increasing deformation rate**

**C : is independent of the deformation rate**

**D : decreases with time**



**Q : 5) Cavitations is primarily associated with which of the following fluid properties**

**A : Specific gravity**

**B : Surface tension**

**C : Viscosity**

**D : Vapour pressure**

**Q : 6) Weber number can be best connected to which of the following:**

- A : Formation of liquid droplet**
- B : High speed flow of a gas**
- C : Flow in closed conduits**
- D : Sloping interface between fluids of different densities**

**Q : 7) Dynamic viscosity has the dimensions as**

**A :  $MLT^{-1}$**

**B :  $ML^{-1}T^{-1}$**

**C :  $ML^{-1}T^{-2}$**

**D :  $M^{-1}L^{-1}T^{-1}$**



**Q : 8) If cohesion  $>$  adhesion, then :**

**A : Capillary rise occurs**

**B : Depression occurs**

**C : Remain plane**

**D : Either rise or fall**

**Q : 9) If, for a fluid in motion, pressure at a point is same in all directions, then the fluid is**

**A : A real fluid**

**B : A Newtonian fluid**

**C : An ideal fluid**

**D : A non-Newtonian fluid**

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**Q : 10) Which of the following is true for a Newtonian fluid?**

**A : Viscous shear stress is independent of velocity gradient**

**B : Viscous shear stress depends linearly on velocity gradient**

**C : Viscous shear stress is zero at all velocity gradient**

**D : Viscous shear stress decreases with velocity gradient**



**Q : 11) If the diameter of the capillary tube is doubled, the capillary rise will be:**

**A : Doubled**

**B : Unaffected**

**C : Halved**

**D : One-fourth**

**Q : 12) Which of the following is most incompressible fluid?**

**A : Gasoline**

**B : Helium**

**C : Kerosene oil**

**D : Water**

**Q : 13) if the mass density of a fluid is  $789 \text{ kg/m}^3$ . Taking  $g = 9.806 \text{ m/sec}^2$ .**

**Specific volume will be**

**A :  $0.126 \text{ m}^3/\text{kN}$**

**B :  $0.129 \text{ m}^3/\text{kN}$**

**C :  $0.122 \text{ m}^3/\text{kN}$**

**D :  $0.132 \text{ m}^3/\text{kN}$**



**Q : 14) Increase of temperature:**

**A : Increases the viscosity of liquid**

**B : Decreases the viscosity of liquid**

**C : Decreases the viscosity of gas**

**D : None of the above**

**Q : 15) In Euler's equation**

**A : no force is neglected**

**B : only force of compressibility is neglected**

**C : both force of compressibility and force of turbulence are neglected**

**D : forces of compressibility, turbulence and velocity are neglected**

**Q : 16) Consider the following statements :**

**1. Fluids of low viscosity are all irrotational**

**2. Rotation of the fluid is always association with shear stress.**

**A : 1 only**

**B : Both 1 and 2**

**C : 2 only**

**D : Neither 1 nor 2**



**Q : 17) The maximum diameter that a capillary tube can have to ensure that a capillary rise of at least 6 mm is achieved when the tube is dipped into a body of liquid with surface tension =  $0.08\text{N/m}$  and density =  $900\text{ kg/m}^3$ , is**

**A : 3 mm**

**B : 5 mm**

**C : 6 mm**

**D : 8 mm**

**Q : 18) Pascal-second is the unit of**

**A : Pressure**

**B : Kinematic viscosity**

**C : Dynamic viscosity**

**D : Surface tension**

**Q : 19) Hygrometer is used for estimating**

**A : Water vapour content of air**

**B : Water content of soil**

**C : Capillary potential of soil water**

**D : Specific gravity of a liquid**

**Q : 20) A real fluid, in which the shear stress is not proportional to the rate of shear strain is:**

**A : Newtonian fluid**

**B : Ideal fluid**

**C : Ideal plastic fluid**

**D : Non-Newtonian fluid**

**Q : 21) If the Mach number for a fluid is less than 1, the flow is:**

**A : Sonic**

**B : Supersonic**

**C : Sub-sonic**

**D : All of the above options**



List-I	List-II
A. Capillarity	1. Cavitation
B. Vapour pressure	2. Density of water
C. Viscosity	3. Shear forces
D. Specific gravity	4. Surface tension

**Q : 22) Match List-I (Fluid properties) with List-II (Related terms) and select the correct answer from the options given below the lists:**

- (a) A-1, B-4, C-2, D-3
- (b) A-1, B-4, C-3, D-2
- (c) A-4, B-1, C-2, D-3
- (d) A-4, B-1, C-3, D-2

**Q : 23) The value of bulk modulus of a fluid is required to determine:**

**A : Reynold's number**

**B : Mach number**

**C : Froude's number**

**D : Euler's number**

**Q : 24) The shear stress-strain graph for Newtonian fluid is a**

**A : Straight line**

**B : Elliptical**

**C : Parabolic curve**

**D : Hyperbolic curve**

List-I	List-II
i. Reynold's number	A. Ratio of inertia force to the surface tension force
ii. Froude's number	B. Ratio of inertia force to the pressure force
iii. Weber's number	C. Ratio of inertia force to the viscose force
iv. Euler's number	D. Ratio of inertia force to the gravity force

**Q : 25) Match the Dimensionless number in Group n to their definitions in Group 'B'. Group 'A'**

(a) i-B, ii-A, iii-D, iv-C

(b) i-C, ii-D, iii-A, iv-B

(c) i-D, ii-C, iii-A, iv-B

(d) i-A, ii-B, iii-C, iv-D

**Q : 26) The flow in open channel is said to be sub critical if the Froude number is**

**A : Less than 1.0**

**B : Equal to 1.0**

**C : Greater than 1.0**

**D : ZERO**



**Q : 27) Which of the flowing fluids can be classified as non-Newtonian?**

- 1. Kerosene oil**
- 2. Diesel oil**
- 3. Human blood**
- 4. Toothpaste**
- 5. Water**

**A : 1 and 2**

**B : 2 and 5**

**C : 3 and 4**

**D : 1 and 5**

**Q : 28) The pressure difference between inside and outside of a soap bubble of diameter  $d$  in terms of surface tension  $\sigma$  is**

**A :  $2 \sigma / d$**

**B :  $8 \sigma / d$**

**C :  $4 \sigma / d$**

**D :  $\sigma / d$**

**Q : 29) When a pressure of  $2 \times 10^4 \text{ kN/m}^2$  is applied to 50 litres of a liquid, its volume is decreased by 0.5 litre. The bulk modulus of liquid in  $\text{N/m}^2$  is**

**A :  $20 \times 10^9$**

**B :  $2 \times 10^9$**

**C :  $4 \times 10^9$**

**D :  $40 \times 10^9$**

**Q : 30) The space between two parallel plates kept 3mm apart is filled with an oil of dynamic viscosity 0.2 Pa.sec. What is the shear stress on the lower fixed plate, if the upper one is moved with a velocity of 1.5m/s ?**

**A : 1**

**B : 10**

**C : 100**

**D : 1000**

**Q : 31 Compressibility is equal to**

(a)  $\frac{dV/V}{dp}$

(b)  $\frac{dp}{-(dV/V)}$

(c)  $\frac{dp}{d\rho}$

(d)  $\sqrt{\frac{dp}{d\rho}}$

**Q : 32) Which one of the following statements indicates unstable equilibrium of fully submerged bodies?**

**A : Centre of buoyancy should be below centre of gravity**

**B : Centre of gravity should be below meta centre**

**C : Centre of gravity should be above meta centre**

**D : Centre of buoyancy should be above centre of gravity**



**Q : 33) The meta centric height of a floating body:**

**A : is the distance between the meta centre of buoyancy**

**B : is the distance between the meta centre and centre of gravity**

**C : does not control the stability of a floating**

**D : is the same about longitudinal and transverse axis**

**Q : 34) The metacentric height is the distance between the**

**A : Centre of gravity of the floating body and the centre of buoyancy**

**B : Centre of gravity of the floating body and the metacentre**

**C : Metacentre and the centre of buoyancy**

**D : Original centre of buoyancy and new centre of buoyancy**

**Q : 35) Centre of buoyancy always**

**A : Coincides with the centre of gravity**

**B : Coincides with the centroid of the volume of fluid displaced**

**C : Remains above the centre of gravity**

**D : Remains below the centre of gravity**

**Q : 36) The condition of stable equilibrium for a floating body is**

**A : The metacentre M coincides with the centre of gravity G**

**B : The metacentre M is above centre of gravity G**

**C : The metacentre M is below centre of gravity G**

**D : The centre of buoyancy B is above centre of gravity G**

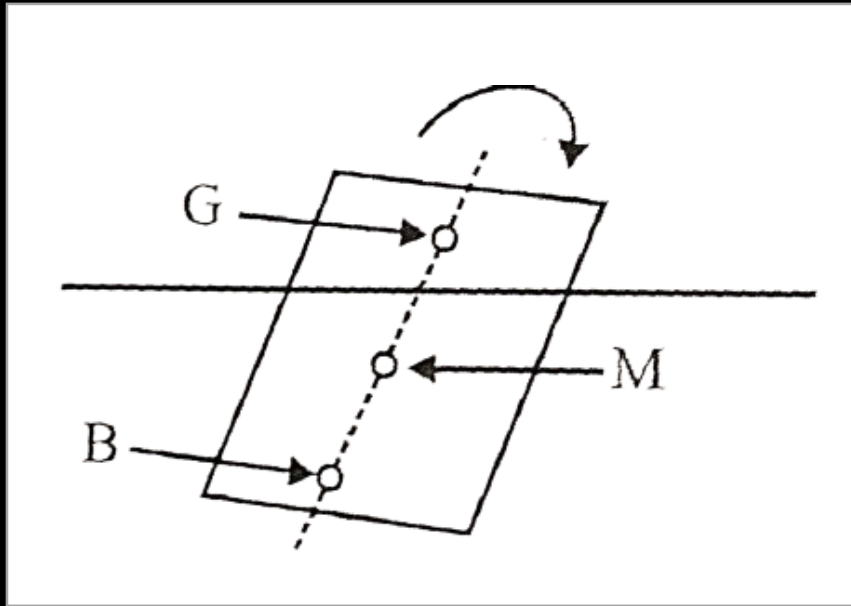
**Q : 37) The depth of centre of pressure for a vertically immersed surface from the liquid surface given by IG**

(a)  $\frac{I_G}{A\bar{X}} - \bar{X}$

(b)  $\frac{I_G}{\bar{X}} - A\bar{X}$

(c)  $\frac{A\bar{X}}{I_G} + \bar{X}$

(d)  $\frac{I_G}{A\bar{X}} + \bar{X}$



**Q : 38) A body is floating as shown in the given figure. The centre of buoyancy, centre of gravity and meta centre are leveled respectively as B, G and M. The body is**

**A : Vertically stable**

**B : Vertically unstable**

**C : Rotationally stable**

**D : Rotationally unstable**



**Q : 39) What fraction of volume of solid piece of metal of specific gravity 6.20 floats above the surface of a container of Mercury with specific gravity of 13.60?**

**A : 0.455**

**B : 0.545**

**C : 0.223**

**D : 1.0**

**Q : 40) when a ship enters sea from river, one can expect it to:**

**A : Rise a little**

**B : Sink a little**

**C : Remain at the same level of the draft**

**D : Rise or fall depending on whether it is steel or wood**

**Q : 41) An open circular cylindrical tank is filled with a liquid to its top level. It is rotated about its vertical axis at such a speed that half the liquid spills out. Then the pressure at the point of intersection of the axis and the bottom is**

**A : One-fourth the value when the cylinder was full**

**B : One-half the value when the cylinder was full**

**C : Same as before rotation**

**D : Equal to the atmospheric pressure**

**Q : 42) If the metacentric heights of two floating bodies A and B are 1 m and 1.5 m, then which of the following is a correct statement?**

**A : The body A is more stable than body B**

**B : The body B is more stable than body**

**C : The bodies A and B have equal stability**

**D : The bodies A and B are unstable**

**Q : 43) With reference to the containers of different shapes having the same base area and filled with the same liquid for equal depths, the apparent contradiction in the hydrostatic force on the base of a liquid container and the weight of liquid in the container is known as**

- A : D'Alembert's paradox**
- B : Hydrodynamic paradox**
- C : Elevator paradox**
- D : Hydrostatic paradox**

**Q : 44) For passenger ships in sea, the meta centric height is kept**

**A : As small as possible**

**B : As large as possible**

**C : Not too much high not too much small**

**D : Can't say**

**Q : 45) The increase in meta centric height**

- 1. Increase stability**
- 2. Decrease stability**
- 3. Increases comfort for passengers**
- 4. Decreases comfort for passengers**

**The correct answer is**

**A : 1 and 3**

**B : 2 and 3**

**C : 1 and 4**

**D : 2 and 4**



**Q : 46) In an inclined plane submerged in water, the centre of pressure is located**

**A : at the centroid**

**B : below the centroid**

**C : above the centroid**

**D : anywhere in the plane**

**Q : 47) A solid body sinks in a fluid when**

**A : The specific gravity of its material is greater than unity**

**B : The buoyancy force does not pass through the meta centre**

**C : The weight of the fluid displaced is less than the weight of the body**

**D : The meta centre lies below the CG**

**Q : 48) In an iceberg, 15% of the volume projects above the sea surface. If the specific weight of sea water is  $10.5 \text{ KN/m}^3$ , the specific weight of iceberg in  $\text{KN/m}^3$ , is: 9**

**A : 12.52**

**B : 8.93**

**C : 9.81**

**D : 7.83**

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