



GOVT.OF KARNATAKA
DEPT. OF PRE-UNIVERSITY
EDUCATION
CET- 2012



1. The density of a block which floats in water with 10% of its volume above the water is

1. 1000 kgm^{-3}
2. 900 kgm^{-3}
3. 800 kgm^{-3}
4. 700 kgm^{-3}



**2. Density of sea water is 1000 kgm^{-3} .
If $g=10 \text{ ms}^{-2}$, the force acting on a
boat of 100 m^3 sunk in a sea is**

- 1. 16 N**
- 2. 61 N**
- 3. 10^6 N**
- 4. 601 N**



3. Hydraulic brake works on the basis of _____

- 1. Pascal's law**
- 2. Bernoulli's principle**
- 3. Poiseuille's law**
- 4. Archimedes principle**

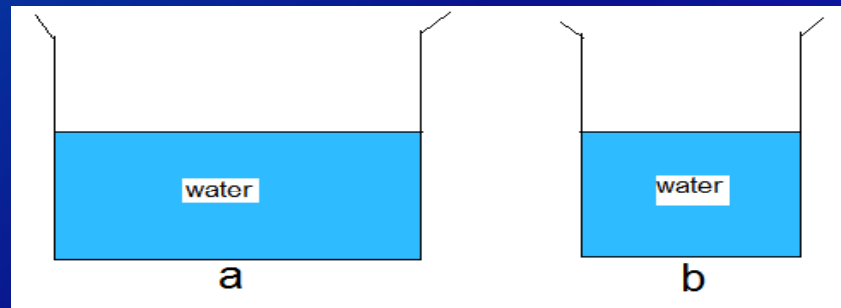


4. The unit of thrust is

1. Nm^{-1}
2. Nm
3. N
4. Nm^{-2}



5. From the adjacent figure, the correct observation is



- 1. The pressure on the bottom of tank 'a' is smaller than at the bottom of 'b'.**
- 2. The pressure on the bottom of tank 'a' is greater than at the bottom of 'b'**
- 3. The pressure on the bottom of 'a' and 'b' is same**
- 4. The pressure depend on the shape of the container**



6. Two substances of equal volumes with the densities ρ_1 and ρ_2 are mixed together. The density of the mixture would be

1. $\rho_1 + \rho_2$

2. $(\rho_1 + \rho_2) / 2$

3. $\sqrt{\rho_1 \rho_2}$

4.
$$\frac{\rho_1 \rho_2}{\rho_1 + \rho_2}$$



- 7. A solid floats in a liquid with a portion of it being submerged. Then**
- a) The liquid exerts an up thrust equal to the weight of the solid**
 - b) The weight of the displaced liquid is equal to the weight of the solid**
 - c) The solid exerts a force equal to its weight on the liquid**

The correct statement (s) from above

- 1. a and b**
- 3. b**

- 2. b and c**
- 4. a, b and c**



8. The mass of a liquid contained in a cylindrical vessel of cross sectional area A is 800 kg. If the pressure at the bottom of the vessel is 4×10^4 pascal, then A is

1. 1m^2

2. 2m^2

3. 0.1m^2

4. 0.2m^2



9. A solid sphere of radius 0.1m just floats in a liquid of density $3 \times 10^3 \text{ kg m}^{-3}$. The mass of the body is

1. $1.39 \times 10^{-6} \text{ kg}$
2. 12.56 kg
3. 1.39 kg
4. $12.56 \times 10^3 \text{ kg}$

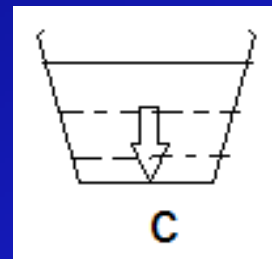
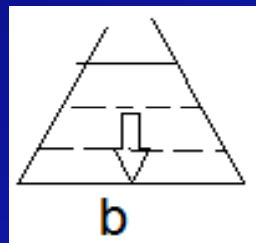
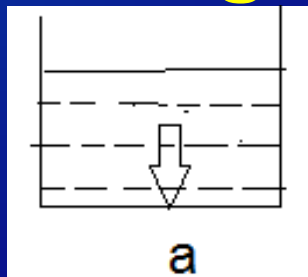


10. An ideal fluid is one which_____

- 1. is incompressible**
- 2. offers no force of friction**
- 3. is compressible**
- 4. is incompressible and offers no force of friction.**



11. Three vessels of different shape are filled with water to same height. Rank the situation according to the pressure exerted on the bottom of the vessel from least to greatest.



1. a,b,c
2. b, a, c
3. c,a,b
4. all the pressures are same



12. A cube of ice is floating in water contained in vessel. When the ice melts, the level of water in the vessel

- 1. remains unchanged**
- 2. rises**
- 3. falls**
- 4. none of these**



13. A cylindrical vessel containing a liquid is fitted with a piston of mass m . If p_0 is the atmospheric pressure and A is the area of cross section of the piston, then the pressure of the liquid just below the piston is given by

1. $p = p_0 + mg$

2. $p_0 = p + mg$

3. $p = p_0 + \frac{mg}{A}$

4. $p_0 = p + \frac{mg}{A}$



14. A cubical block of steel of side 'a' and density ' ρ ' floats on mercury of density ' σ ' with a part of it being submerged. The height of the block above the mercury level is given by

1.a $\left[1 - \frac{\rho}{\sigma}\right]$

2.a $\left[1 + \frac{\rho}{\sigma}\right]$

3.a $\left[1 - \frac{\sigma}{\rho}\right]$

4.a $\left[1 + \frac{\sigma}{\rho}\right]$



15. The pressure in the water pipe at the ground level in a building is $19.6 \times 10^4 \text{ Nm}^{-2}$ and at the fourth floor is $4.9 \times 10^4 \text{ Nm}^{-2}$. The height of the fourth floor is (density of water is 1000 kgm^{-3})

- 1. 10m**
- 3. 9.8m**

- 2. 15m**
- 4. 15.9m**



16. A fluid is undergoing streamline flow. Then_____

- 1. the velocity of any molecule is same**
- 2. the pressure is same at all the points**
- 3. the velocity at a given point is same**
- 4. the velocity at all the points is same**



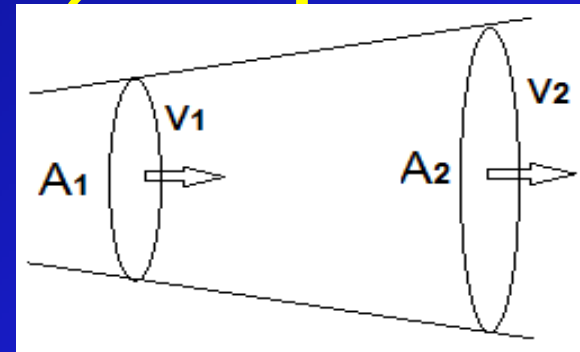
17. An incompressible fluid flows through a pipe of non uniform cross-sectional area as shown in the figure. If A_1 and A_2 are the area of cross-sections at A and B, v_1 and v_2 are the velocities at A and B, then the ratio v_1/v_2 is equal to

1. $\frac{A_1}{A_2}$

2. $\sqrt{\frac{A_1}{A_2}}$ **A**

3. $\frac{A_2}{A_1}$

4. $\sqrt{\frac{A_2}{A_1}}$



B



18. Bernoulli's principle is derived on the basis of law of conservation of _____

- 1. energy**
- 2. momentum**
- 3. mass**
- 4. angular momentum**



19. A person standing on a railway platform close to a fast moving train always has a tendency to fall towards the train. This is a consequence of

- 1. Newton's third law of motion**
- 2. Archimedes principle**
- 3. Bernoulli's theorem**
- 4. None of these**



20. When air is blown in between the two light balls suspended close to each other, the two balls will ____

- 1. move apart**
- 2. move close to each other**
- 3. remain stationary**
- 4. either move close or apart**



21. A gale blows over the roof of a house. The force on the roof due to gale is ____

- 1. in the down ward direction**
- 2. in the upward direction**
- 3. in the direction of the gale**
- 4. zero**



22. A cylindrical vessel open at the top contains 20 litres of water. A small hole is provided at the bottom of the vessel so that water drains out. 10 litres of water drains out in a time interval t_1 and the next 10 litres at time t_2 . then

1. $t_1 = t_2$
3. $t_1 > t_2$

2. $t_1 < t_2$
4. none of these



23. The free surface of a liquid at rest always tends to acquire minimum surface area due to ____

- 1. viscosity**
- 2. pressure**
- 3. surface tension**
- 4. gravitational force**



24. insects can walk on the surface of water because _____

- 1. they are very light**
- 2. they can swim on water**
- 3. of the up thrust**
- 4. of the surface tension**



25. Mercury does not wet glass
because _____

1. the angle of contact is obtuse
2. the adhesive force is more
3. the cohesive force is more
4. both 1 and 3



26. How does the coefficient of viscosity ' η ' of the gases depend upon temperature?

1. $\eta \propto T^{1/2}$

2. $\eta \propto T^{-1/2}$

3. $\eta \propto T^2$

4. $\eta \propto T^{-2}$



27. During wind storm, roofs of houses may be blown off because

1. wind creates high pressure over the roof
2. wind creates low pressure over the roof
3. roofs are not tightly bound
4. none of the above



28. Mobility of a liquid decreases with _____

1. increase in viscosity
2. decrease in viscosity
3. increase in surface tension
4. decrease in surface tension



29. A fine hole is made at the bottom of a cylinder of height 50cm. What is the maximum speed with which water can flow out of the hole? $g=10 \text{ ms}^{-2}$

1. $\sqrt{10} \text{ ms}^{-1}$

2. 1 ms^{-1}

3. 0.5 ms^{-1}

4. 10 ms^{-1}



30. Three liquids of equal masses are taken in three identical cubical vessels A, B and C. Their densities are ρ_A , ρ_B and ρ_C respectively. But $\rho_A < \rho_B < \rho_C$. The force exerted by the liquid on the base of the cubical vessel is

-
1. minimum in vessel C
 2. maximum in vessel C
 3. maximum in vessel A
 4. the same in all the vessels



31. Water is in streamline flow along a horizontal pipe with non uniform cross section. At a point in the pipe where the area of cross section is 10cm^2 , the velocity of water is 1 ms^{-1} and the pressure is 2000Pa . The pressure at another point where the cross sectional area is 5 cm^2 is _____

1. 2000 Pa

2. 4000 Pa

3. 500 Pa

4. 1000 Pa



32. 27 identical drops of water are falling down vertically in air each with a terminal velocity 0.15ms^{-1} .if they combine to form a single big drop, the terminal velocity is _____

1. 13.5ms^{-1}

2. 1.35ms^{-1}

3. 5.31ms^{-1}

4. 0.15ms^{-1}



33. An air bubble of 1cm radius is rising at a speed of 0.5cm s^{-1} through a liquid of density 0.8g cm^{-3} . The coefficient of viscosity of a liquid (neglect the density of air) is _____

1. 843 poise
2. 438 poise
3. 348 poise
4. 834 poise



34. The dimensional formula of surface tension is _____

1. $M^1L^0T^{-2}$

2. $M^1L^2T^{-2}$

3. $M^1L^1T^2$

4. $M^1L^1T^{-1}$



35. When a wire ring is dipped into a soap solution and taken out then ____

1. soap solution wets the ring
2. a thin circular film is formed
3. ring becomes heavy
4. ring becomes clean



36. When the temperature is increased the angle of contact is _____

1. increases
2. decreases
3. remains same
4. becomes zero



37. If the angle of contact is less than 90° , then ____

1. there is a capillary rise
2. liquid surface will be concave upwards
3. liquid wets the surface
4. all the above are true



38. The capillary rise or fall is given by _____

1.
$$h = \frac{2T\cos\theta}{r\rho g}$$

2.
$$h = \frac{T\cos\theta}{2\rho g}$$

3.
$$h = \frac{2T\cos\theta}{\rho g}$$

4.
$$h = \frac{2r\cos\theta}{T\rho g}$$



39. The difference of pressure between the inside and outside of a spherical drop of water of radius 1mm is (surface tension of water is $70 \times 10^{-3} \text{ N/m}$)

1. 140 Nm^{-2}

2. 70 Nm^{-2}

3. 35 Nm^{-2}

4. none of these

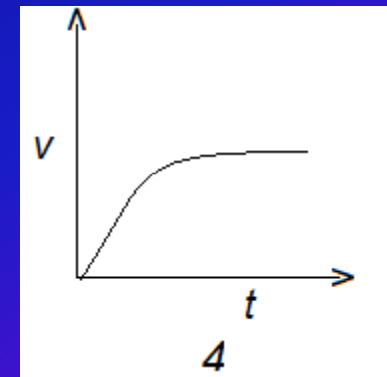
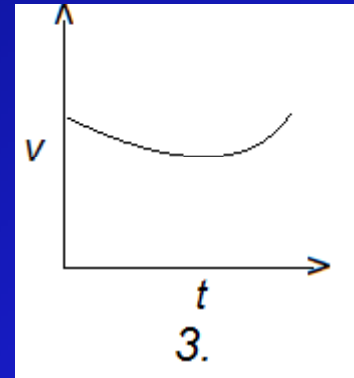
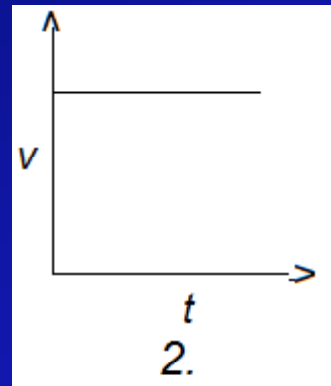
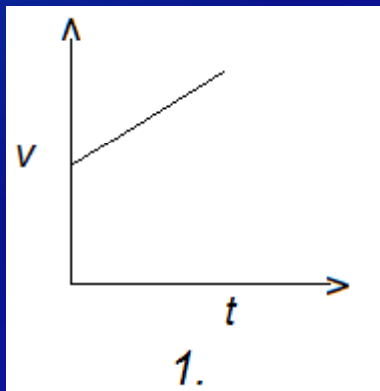


40. If a liquid drop is broken into a number of drops, then _____

1. total surface area increases
2. temperature decreases
3. surface energy increases
4. all the above are correct



41. Which of the following figure represents the velocity of a spherical body falling through a viscous liquid.





42. A drop of water is breaks into two droplets of equal size , then _____

- 1.the sum of temperature of the two droplets is equal to the original drop.
2. the sum of the masses of the two droplets is equal to the mass of original drop.
3. the sum of the surface areas of two droplets is equal to the surface area of the original drop.
4. none of the above are true



43. A liquid meniscus in a capillary tube will be convex if the angle of contact is

1. greater than 90°
2. less than 90°
3. equal to 90°
4. equal to 0°



44. The angle of contact
between pure water and
clean glass is

1. 90°

2. 0°

3. 40°

3. 180°



45. A liquid does not wet the solid surface if the angle of contact is _____

1. zero
3. 90°

2. an acute one
4. an obtuse one



46. Two tubes of the same material but of different radii are dipped in a liquid. The height through which a liquid rises in one tube is 2.2cm and in the other 6.6cm. The ratio of their radii is _____

1. 9:1 2. 1:9 3. 3:1 4. 1:3



47. A liquid contained in a vessel. The liquid-solid adhesive force is very weak as compared to a the cohesive force in a liquid. The shape of a liquid surface near the solid will be _____

1. horizontal

2. concave

3. almost vertical

4. convex



48. A body weighs 50grams in air and 40grams in water. How much would it weigh in a liquid of specific gravity 1.5?

1. 45 grams

2. 65 grams

3. 35 grams

4. 30 grams



49. Water rises in plant fibres
due to _____

1. osmosis
2. fluid pressure
3. viscosity
4. capillarity



50. A fish weighs 348g in air and 23g in pure water. What is the relative density of the fish?

1. 1.07

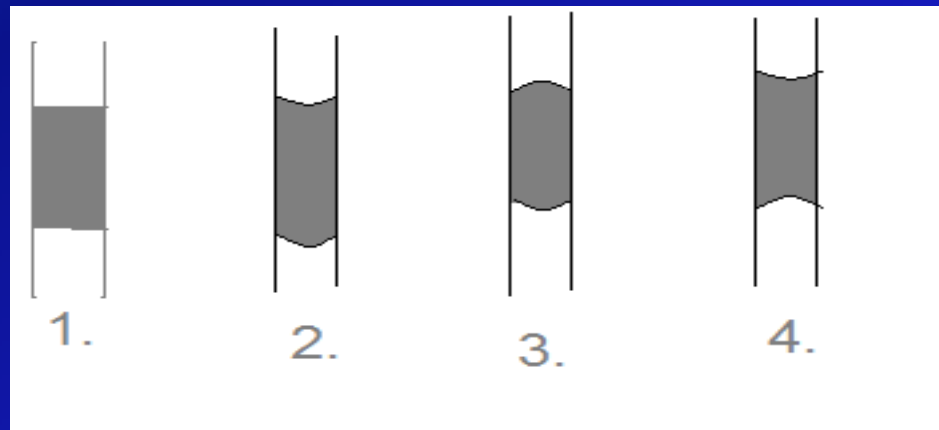
2. 1.007

3. 15.13

4. 2.07



51. A vertical glass capillary tube, open at both ends, contains some water. Which of the following shapes may be taken by the water in the tube?





52. Density of ice is d and that of water is d' . What will be the decrease in volume when a mass M of ice melts?

1. $\frac{M}{d' - d}$

2. $\frac{d' - d}{M}$

3. $M \left[\frac{1}{d} - \frac{1}{d'} \right]$

4. $\frac{1}{M} \left[\frac{1}{d} - \frac{1}{d'} \right]$



THANK YOU

AND

BEST OF LUCK