



# MATHS

## BOOKS - ARIHANT PUBLICATION

### JHARKHAND

## HYDROSTATICS

**Exam Booster For Cracking Exam**

1. If two liquids of same masses but densities  $p_1$  and  $p_2$ , respectively are mixed, then the

density of mixture is given by

$$\text{A. } p = \frac{p_1 + p_2}{2}$$

$$\text{B. } p = \frac{p_1 + p_2}{2p_1p_2}$$

$$\text{C. } p = \frac{2p_1p_2}{p_1 + p_2}$$

$$\text{D. } p = \frac{p_1p_2}{p_1 + p_2}$$

**Answer: C**



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2. If two miscible liquids of same volume but different densities  $P_1$  and  $P_2$  are mixed, then the density of the mixture is given by

A.  $p = \frac{p_1 + p_2}{2}$

B.  $p = \frac{p_1 + p_2}{2p_1p_2}$

C.  $p = \frac{2p_1p_2}{p_1 + p_2}$

D.  $p = \frac{p_1p_2}{p_1 + p_2}$

**Answer: A**



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3. Equal masses of water and a liquid of density  $2\text{g/cm}^3$  are mixed together. The density of mixture is:

A.  $\frac{2}{3}$

B.  $\frac{4}{3}$

C.  $\frac{3}{2}$

D. 3

**Answer: B**



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4. Pressure at a point inside a liquid does not depend on

A. the depth of the point below the surface of the liquid

B. the nature of the liquid

C. the acceleration due to gravity at that point

D. the shape of the containing vessel

**Answer: D**



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5. Two stretched membranes of areas  $2\text{cm}^2$  and  $3\text{cm}^2$  are placed in a liquid at the same depth. The ratio of the pressures on them is:

A. 1 : 1

B. 2 : 3

C. 3 : 2

D.  $2^2 : 3^2$

**Answer: A**



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6. A dam for water reservoir is built thicker' at the bottom than at the top because

A. pressure of water is very large at the bottom due to its large depth

B. pressure of water is very small at the bottom due to its large depth

C. it is a custom

D. it is due to surface tension of water

**Answer: A**



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7. A tank 5 m high is half filled with water and then is filled to top with oil of density  $0.85g/cm^3$  The pressure at the bottom of the tank, due to these liquids is

A.  $1.85g/cm^2$

B.  $89.25g/cm^2$

C.  $462.5g/cm^2$



D.  $500\text{g} / \text{cm}^2$

**Answer: C**



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**8.** As an air bubble comes from the bottom of a lake to the top, its radius \_\_\_\_\_

A. increases

B. decreases

C. does not change

D. becomes zero

**Answer: A**



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9. When a large bubble rises from the bottom of a lake to the surface, its radius doubles. The atmospheric pressure is equal to that of a column of water of height  $H$ . The depth of the lake is

A.  $H$

B. 2H

C. 7H

D. 8H

**Answer: C**



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**10.** Pressure applied to an enclosed fluid is transmitted undiminished to every portion of the fluid and the walls of the containing vessel. This law was first formulated by

A. Bernoulli

B. Archimedes

C. Boyle

D. Pascal

**Answer: D**



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**11.** A body is experiencing an atmospheric pressure of  $1.01 \times 10^5 \text{ N/m}^2$  on the surface of a pond. The body will experience double of

the previous pressure if it is brought to a depth of (given density of pond water  $= 1.03 \times 10^3 \text{ kg/m}^2, g = 10 \text{ m/s}^2$ )

A.  $8\text{m}$

B.  $8.6\text{m}$

C.  $9.7\text{m}$

D.  $10.3\text{m}$

**Answer: C**



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12. When a body is wholly or partially immersed in a liquid it appears to lose weight.

This loss of weight is equal to the weight of

A. water displaced by the body

B. liquid displaced by the body

C. equal volume of water

D. equal volume of liquid

**Answer: B**



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13. Two pieces of metal when immersed in a liquid have equal upthrust on them, then

- A. both pieces must have equal weights
- B. both pieces must have equal densities
- C. both pieces must have equal volume
- D. both are floating to the same depths

**Answer: C**



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14. A block of steel of size  $5\text{cm} \times 5\text{cm} \times 5\text{cm}$  is weighed in water. If the relative density of steel is 7. its apparent weight is:

A.  $6 \times 5 \times 5 \times 5g$

B.  $4 \times 4 \times 4 \times 7g$

C.  $5 \times 5 \times 5 \times 7g$

D.  $4 \times 4 \times 4 \times 6g$

**Answer: A**



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15. A body floats with one-third of its volume outside water and  $\frac{3}{4}$  of its volume outside another liquid. The density of another liquid is :

A.  $\frac{9}{4} g/cc$

B.  $\frac{4}{9} g/cc$

C.  $\frac{8}{3} g/cc$

D.  $\frac{3}{8} g/cc$

**Answer: C**



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**16.** A bird resting on the floor of an airtight box which is being carried by a boy star flying.

The boy will feel that the box is now :

A. heavier

B. lighter

C. same in weight

D. lighter in the beginning and heavier

later

**Answer: C**



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17. A parrot sitting on the floor of a wire cage which is being carried by a boy, starts flying.

The boy will feel that the box is now

A. heavier

B. lighter

C. same in weight

D. lighter in the beginning and heavier

later

**Answer: B**



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**18.** A raft of wood (density =  $600\text{kg}/\text{m}^3$ ) of mass  $120\text{kg}$  floats in water. How much weight can be put on the raft to make it just sink?

A. 120 kg

B. 200 kg

C. 40 kg

D. 80 kg

**Answer: D**



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**19.** An iceberg is floating partly immersed in sea water, the density of sea water is  $1.03gcm^{-3}$  and that of ice is  $0.92gcm^{-3}$ . The fraction of the total volume of the iceberg above the level of sea water is

A. 8.1 %

B. 11 %

C. 34 %

D. 0.9 %

**Answer: D**



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**20.** A piece of ice is floating in a jar containing water. When the ice melts, then the level of water

A. rises

B. falls

C. remains unchanged

D. rises or falls depending upon the mass  
of ice

**Answer: C**



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**21. An atmosphere**

A. is a unit of pressure

B. is a unit of force

C. gives us an idea of composition of air

D. is the height above which there is no air

**Answer: A**



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22. A body is just floating in a liquid (their densities are equal). If the body is slightly pressed down and released it will :



A. start oscillating

B. sink to the bottom

C. come back to the same position

immediately

D. come back to the same position slowly

**Answer: B**



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23. Find the density of a block of wood that floats in water with 0.1 of its volume above water

A.  $0.9g/cc$

B.  $0.9g/cc$

C.  $0.1g/cc$

D.  $0.1g/cc$

**Answer: A**



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24. A cork ball is floating on the surface of water in a beaker. The beaker is covered with a bell jar and the air is evacuated. What will happen to the ball?

- A. Sinks a little
- B. Rise a little
- C. remains unchanged
- D. Sink completely

**Answer: A**



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25. In making an alloy, a substance of specific gravity  $s_1$  and mass  $m_1$  is mixed with another substance of specific gravity of the alloy is

A.  $\left( \frac{m_1 + m_2}{s_1 + s_2} \right)$

B.  $\left( \frac{s_1 s_2}{m_1 + m_2} \right)$

C.  $\left( \frac{m_1 + m_2}{m_1 / s_1 + m_2 / s_2} \right)$

D.  $\left( \frac{m_1 / s_1 + m_2 / s_2}{m_1 + m_2} \right)$

**Answer: C**



**26.** A block weight 15 N in air and 12 N when immersed in water find the specific gravity of block.

A. 0.8

B. 0.25

C.  $5/4$

D. 5

**Answer: C**



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27. A wooden cube first floats inside water when a 200 g mass is placed on it. When the mass is removed the cube is 2 cm above water level. The side of cube is

A. 5cm

B. 10cm

C. 15cm

D. 20cm

**Answer: B**



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**28.** Two solids  $A$  and  $B$  floats in water. It is observed that  $A$  floats with half of its volume immersed and  $B$  Floats with  $2/3$  of its volume immersed. The ratio of densities of  $A$  and  $B$  is

A. 4 : 3

B. 2 : 3

C. 3 : 4

D. 1 : 3

**Answer: C**



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**29.** A 200g block while sinking in water, displaces 25g of water. If we leave the block in water independently then, then block will

A. sink

B. float with whole volume



C. partially float

D. None of the above

**Answer: C**



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**30.** One boy is carrying a bucket of water by his one hand and wooden cube in his other hand. If he places the wooden cube in the bucket of water, then he will feel

A. same weight

B. more weight

C. less weight

D. None of the above

**Answer: C**



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**31.** A boat carrying a large number of stones is floating in a water tank. What will happen to

water level if the stone are unloaded into water?

A. Rise

B. Fall

C. Remain unchanged

D. Rise till half the number of stones are unloaded and then begin to fall

**Answer: B**



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32. A body is floating in a liquid. The upthrust on the body is

A. equal to weight of liquid displaced

B. zero

C. less than the weight of liquid displaced

D. weight of body weight of liquid displaced

**Answer: A**



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33. A ball whose density is  $0.4 \times 10^3 \text{ kg/m}^3$  falls into water from a height of 9 cm. To what depth does the ball sink?

A. 9cm

B. 6cm

C. 4.5cm

D. 2.25cm

**Answer: B**



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34. An object of relative density 0.75 is floating in a liquid with  $500\text{cm}^3$  of the object, if the relative density of liquid is 1.02.

A.  $60\text{cm}^3$

B.  $680\text{cm}^3$

C.  $700\text{cm}^3$

D.  $740\text{cm}^3$

**Answer: B**



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**35.** In a particular amount of steel, there 80 % bronze and 20 % zinc. Density of bronze is  $8.9g/cm^3$  and that of zinc is  $7.1g/cm^3$ . Find the density of steel.

A.  $8.5g/cm^3$  (approx.)

B.  $8.0g/cm^3$  (approx.)

C.  $7.9g/cm^3$  (approx.)

D.  $8.9g/cm^3$  (approx.)

**Answer: A**



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