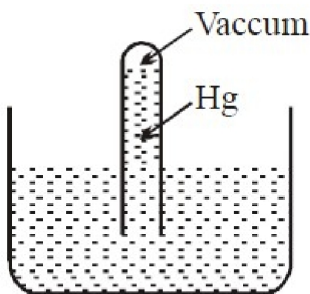


# Mechanical Properties of Fluids

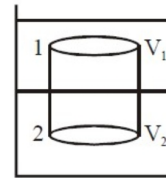
1. **Assertion (A):** Blood pressure of heart is same whether you lie down or stand up.  
**Reason (R):** Pressure varies with height in a fluid under gravity.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
 (3) (A) is true but (R) is false  
 (4) Both (A) and (R) are false

2. A barometer made of a very narrow tube (see fig.) is placed at normal temperature and pressure. The coefficient of volume expansion of mercury is  $0.00018/^\circ\text{C}$  and that of the tube is negligible. The temperature of mercury in the barometer is now raised by  $1^\circ\text{C}$  but the temperature of the atmosphere does not change.
- Assertion (A):** The mercury height in the tube remains unchanged.  
**Reason (R):** The atmospheric pressure remains same.



- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
 (3) (A) is true but (R) is false  
 (4) Both (A) and (R) are false

3. **Assertion (A):** When a body floats such that its parts are immersed into two immiscible liquids, then force exerted by liquid 1 is of magnitude  $\rho_1 V_1 g$   
**Reason (R):** Total buoyant force =  $\rho_1 V_1 g + \rho_2 V_2 g$



- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
 (3) (A) is true but (R) is false  
 (4) Both (A) and (R) are false
4. **Assertion (A):** A raindrop after falling through some height attains a constant velocity.  
**Reason (R):** At constant velocity the viscous drag plus buoyant force is just equal to its weight.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
 (3) (A) is true but (R) is false  
 (4) Both (A) and (R) are false
5. **Assertion (A):** In streamline flow streamlines never intersect each other.  
**Reason (R):** If streamline intersect then their must two velocities of fluid particle at the point of intersection, which is impossible.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
 (3) (A) is true but (R) is false  
 (4) Both (A) and (R) are false

6. **Assertion (A):** A mercury barometer always reads less than actual pressure.  
**Reason (R):** The density of liquid varies with rise of temp.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
7. **Assertion (A):** Floating condition of needle does not depend on length of needle.  
**Reason (R):** In floating condition, weight of needle balance by force due to surface tension.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
8. **Assertion (A):** The stream of water flowing at high speed from a garden hose pipe tends to spread like a fountain when held vertically up, but tends to narrow down when held vertically down.  
**Reason (R):** In any steady flow of an incompressible fluid, the volume flow rate of the fluid remains constant.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
9. **Assertion (A):** If liquid is equilibrium, the pressure is same at all the points in a horizontal plane  
**Reason (R):** In equilibrium pressure in a fluid is same at all the points if they are at same height.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
10. **Assertion (A):** At same horizontal level of same liquid pressure is always same.  
**Reason (R):** When any fluid travels from a region of higher pressure to lower pressure. It gains some speed.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
11. **Assertion (A):** Aeroplanes having wings fly at low altitudes while jet planes fly at high altitudes.  
**Reason (R):** At low altitudes air is dense, whereas at high altitude air is less-dense.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false
12. **Assertion (A):** A Basilisk lizard can run across the top of a water surface.  
**Reason (R):** water does not stick to its legs.  
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false



**13. Assertion (A):** The stream of water emerging from a water tap "necks down" as it falls.

**Reason (R):** The volume flow rate at different levels is same.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

**14. Assertion (A):** Water flows faster than honey.

**Reason (R):** The co-efficient of viscosity of water is less than honey.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

**15. Assertion (A):** Weight of a empty balloon measured in air is  $W_1$ . If air at atmospheric pressure is filled inside balloon and again weight of the balloon is measured. Weight of balloon in second case is equal to  $W_1$ .

**Reason (R):** Upthrust is equal to weight of the fluid displaced by the body.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

**16. Assertion (A):** The angle of contact of a liquid decreases with increase in temperature.

**Reason (R):** With increase in temperature, the surface tension of liquid increases.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

**17. Assertion (A):** The shape of a liquid drop is spherical.

**Reason (R):** The pressure inside the drop is greater than that of outside.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

**18. Assertion (A):** Surface energy of an oil drop is same whether placed on glass or water surface.

**Reason (R):** Surface energy is dependent only on the properties of oil.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

### ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	2	4	4	1	1	2	1	1	1	4	4	1	3	2	2	3	2	4