Fluid — DPP - 1

1. Which among the following is a unit of pressure?
   - (A) Atmosphere
   - (B) Torr
   - (C) cm of Hg
   - (D) All of these

2. The S.I. unit of pressure is:
   - (A) $N\text{-}m^{-2}$
   - (B) Pascal
   - (C) $dyne\text{-}cm^2$
   - (D) Both (A) and (B)

3. Pressure exerted by a liquid column:
   - (A) Is independent of its density
   - (B) Is independent of the acceleration due to gravity
   - (C) Decreases with depth
   - (D) None of these

4. Thrust is a:
   - (A) Scalar quantity
   - (B) Vector quantity
   - (C) Tangential force
   - (D) None of these

5. Pressure is a:
   - (A) Scalar quantity
   - (B) Vector quantity
   - (C) Normal force
   - (D) None of these

6. The S.I. unit of thrust is :
   - (A) N
   - (B) dyne
   - (C) Pa
   - (D) kg-wt

7. Pressure can be calculated as:
   - (A) ——
   - (B) ————
   - (C) ————
   - (D) All of these

8. The ratio of S.I. unit of pressure to C.G.S. unit of pressure is:
   - (A) 1
   - (B) 10
   - (C) 100
   - (D) 1000

9. The upward force acting on an object immersed in a liquid is called:
   - (A) Buoyancy
   - (B) Buoyant force
   - (C) Upthrust
   - (D) Both B & C are correct

10. The Buoyant force depends on:
    - (A) Depth of a liquid
    - (B) Colour of a liquid
    - (C) Density of liquid
    - (D) All of these

11. What is the difference between thrust and pressure?

12. Explain the term atmospheric pressure.

13. You are provided with a hollow iron ball of volume 20 cc and mass 15g and a solid iron ball of same volume and mass of 30g. Both are placed on the surface of water contained in a large tub. Which will float?

14. Explain why does a block of plastic released under water come up to the surface of water.

15. A ship made of iron and steel does not sink in sea, but the same amount of iron and steel in form of a solid sphere would sink. Why?

Fluid   DPP - 2

1. A body floats in a liquid if the buoyant force is:
   - **(A)** Zero
   - **(B)** Greater than its weight
   - **(C)** Less than its weight
   - **(D)** Equal to its weight

2. When a body is weighed in a liquid the loss in its weight is equal to?
   - **(A)** Weights of liquid displaced by the body
   - **(B)** The difference in weights of body in air and liquid
   - **(C)** The upthrust of liquid on the body
   - **(D)** All of these

3. The balloon stops rising up beyond a particular height when density of gas inside the balloon :
   - **(A)** Exceeds the density of air outside
   - **(B)** Equals the density of air
   - **(C)** becomes less than the density of air
   - **(D)** None of these

4. A block metal weight 5 N in air and 2 N when immersed in a liquid. The buoyant force is :
   - **(A)** 3 N
   - **(B)** 5 N
   - **(C)** 7 N
   - **(D)** Zero

5. The apparent weight of wood floating on water if its weights 100 g in air is :
   - **(A)** 400 g
   - **(B)** 300 g
   - **(C)** 100 g
   - **(D)** Zero

6. Two pieces of metal when completely 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 volumes
   - **(D)** Both are floating to the same depth

7. A solid iron sphere of radius 1 m and solid iron cube of edge length 1 m are immersed in a liquid. Which of them will experience greater up thrust :
   - **(A)** Cube
   - **(B)** Sphere
   - **(C)** Equal
   - **(D)** None of these

8. Buoyant force is inversely proportional to :
   - **(A)** Volume of body immersed
   - **(B)** Density of fluid
   - **(C)** Acceleration due to gravity
   - **(D)** Temperature of fluid

9. As we move upwards, the atmospheric pressure :
   - **(A)** Increases
   - **(B)** Decreases
   - **(C)** Remains same
   - **(D)** Cannot be said

10. The ratio of S.I. units to C.G.S. unit of density is :
    - **(A)** 10^3
    - **(B)** 10^2
    - **(C)** 10^{-2}
    - **(D)** 10^{-3}

11. Write a short note on Buoyancy and Buoyant force.

12. Discuss the various factors affecting Buoyant force.

13. Imagine a body that is completely submerged in water, but whose depth of submergence can be varied. In which case does it experience a larger upthrust, when it is submerged deep or shallow explain.

14. An object is immersed in different liquids. Does same buoyant force acts on the object due to all the liquids? Explain.

15. Write the Archimedes Principle and its uses.

Fluid   DPP - 3

1. If a sample of metal weights 210 g in air, 180 g in water and 120 g in a liquid :
   (A) R.D. of metal is 3   (C) R.D. of liquid is 7
   (B) R.D. of metal is 7   (D) R.D. of liquid (1/3)

2. Equal volumes of alcohol (R.D. = 0.74) and water are mixed. The volume of the mixture is 0.96 of its original volume. The R.D. of mixture is:
   (A) 0.74   (B) 0.90   (C) 1.64   (D) 6.66

3. Which of the following is the incorrect statement?
   (A) It is easier to lift a heavy stone under water than in air.
   (B) It is easier to swim in sea water than in river water.
   (C) It is easier to float on water after taking a deep breath.
   (D) A ship sails down into water when it sails from river into sea.

4. The density of wooden block that floats in water with 0.1 of its volume above water is:
   (A) 0.1 g/cm^3 (C) 1 g/cm^3
   (B) 0.9 g/cm^3 (D) 9 g/cm^3

5. A beaker containing water weighs 100 gwt. It is placed on the pan of a balance and a piece of metal weighing 70 gwt and having a volume of 10 cm^3 is placed inside the water in the beaker. The weight of the beaker containing water and the metal would be:
   (A) 170 gwt   (C) 100 gwt
   (B) 160 gwt   (D) 30 gwt

6. A cylinder of wood floats vertically in water with one-fourth of its length out of water. The density of wood is:
   (A) 0.25 g/cm^3 (C) 0.75 g/cm^3
   (B) 0.5 g/cm^3 (D) 1 g/cm^3

7. Two solids X and Y float in water. X floats with half of its volume submerged while Y floats with one-third of its volume out of water. The densities of X and Y are in the ratio of:
   (A) 4: 3   (C) 2: 3
   (B) 3: 4   (D) 1: 3

8. The buoyant force acting on a body due to different fluids is:
   (A) same   (C) zero
   (B) different   (D) none of these

9. A piece of wood is held under water, the upthrust on it is:
   (A) Equal to the weight of the wooden piece
   (B) More than the weight of the wooden piece
   (C) Less than the weight of the wooden piece
   (D) zero

10. A piece of iron has dimensions 3 cm × 1.5 cm × 6 cm. If its mass is 205.2 gms, its density is -
    (A) 5.6 gmcm^{-3} (C) 7.6 gmcm^{-3}
    (B) 8.4 gmcm^{-3} (D) 76 gmcm^{-3}

11. The pressure of 2.5 Pa is applied on a surface of area 10 cm2. Find the force on the surface.

12. An empty chamber of petrol of volume 50 litre has a mass 8 kg. It is filled with petrol of relative density 0.7. What is the mass of the petrol filled chamber?

13. If a toy boat in a tank sinks, what will happen to the level of water?

14. A solid of density 'D' is floating in a liquid of density 'd'. If 'v' is the volume of solid submerged in the liquid and V is the total volume of the solid, What is the value of $\frac{v}{V}$?

15. Define atmospheric pressure. How does it vary with altitude?