Chapter – 11
Force and Pressure

- **Force**: A push or a pull, that changes or tends to change the state of rest or of uniform motion of an object or changes its direction or shape.
- A force arises due to the interaction between two objects.
- Force has magnitude as well as direction. The SI unit of force is newton.
- A change in the speed of an object or the direction of its motion or both implies a change in its state of motion.
- Force acting on an object may cause a change in its state of motion or a change in its shape.
- A force can act on an object with or without being in contact with it.

Types of Forces:

Contact Forces: The forces act on a body when the source of force is in actual contact with the body. The point where the force is applied on an object is called the point of application of force (or point of contact).

- (i) **Muscular Force:** The force exerted by the muscles of the body. We make use of muscular force of animals like bullocks, horses and camels to get our activities done.
- (ii) **Mechanical Force:** The force produced by a machine.
- (iii) **Frictional Force:** The force that opposes the motion of an object.

Non-Contact Forces: Forces which do not involve physical contact between two bodies on which they act.

- (i) **Magnetic Force:** A magnet exerts a non-contact force on objects made of iron, steel, cobalt or nickel.

  (ii) **Electrostatic Force:** The force which result due to repulsion of similar charges or attraction of opposite charges.

  (iii) **Gravitational Forces:** The force that exists between any two bodies by virtue of their mass.

- **Pressure: Thrust** acting per unit surface area is called pressure. Thrust is the force acting on an object perpendicular to its surface. In SI system, pressure is measured in newton per square metre which is equal to 1 pascal (Pa).
- Like solids, fluids (liquids and gases) also exert pressure. A solid exerts pressure only in the downward direction due its weight, whereas liquids and gases exert pressure in all directions. Hence liquids and gases exert pressure on the walls of their container.
- The thick blanket of air that covers the earth is termed atmosphere. The pressure exerted by the atmosphere is called atmospheric pressure. The tremendous atmospheric pressure surrounding us is not felt by us because the fluid pressure inside our bodies counter-balances the atmospheric pressure around us.