CHAPTER 11: Force And Pressure

- Force – It is a‘Push’ or a ‘Pull’on an object is called force.
- Motion is imparted to objects due to the action of force.

- **Force is generated due to interaction:**
  1. When ever force is acting on a body, it causes the displacement in direction of the applied force.
  2. Two objects must interact for a force to come into play. Thus, an interaction of one object with another object results in a force between the two objects.
  3. Forces applied on an object in the same direction add to one another.
  4. If the two forces act in the opposite directions on an object, the net force acting on it is the difference between the two forces.
  5. Magnitude: The strength of a force is usually expressed by its magnitude
  6. Force applied could be larger or smaller than the other or equal to each other.
  7. If the direction or the magnitude of the applied force changes, its effect also changes.
  8. The net force on an object is zero if the two forces acting on it in opposite directions are equal.

- **Force can Change the State of Motion:**
  1. Force applied on an object may change its speed.
  2. If the force applied on the object is in the direction of its motion, the speed of the object increases.
  3. If the force is applied in the direction opposite to the direction of motion, then it results in a decrease in the speed of the object.
  4. A change in either the speed of an object, or its direction of motion, or both,is described as a change in its state of motion.
  5. Thus, a force may bring a change in the state of motion of an object
  6. State of motion: an object is described by its speed and thedirection of motion.
  7. The state of rest is considered to be the state of zero speed.
  8. An object may be at rest or in motion; both are its states of motion.
  9. Many times, application of force does not result in a change in the state of motion.

- **Force can lead to change in shape:**
  1. Force on an object may change its shape.
  2. An object cannot move by itself,it cannot change speed by itself, itcannot change direction by itself andits shape cannot change by itself.

- **Contact Forces:**
  1. Muscular Force:

- The force is caused by the action of muscles in our body.
- The force resulting due to the action of muscles is known as the muscular force.
- The muscular force that enablesus to perform all activities involving movement or bending of our body.
- Animals make use of muscular force to carry out their physical activities and other tasks.

- Animals like bullocks, horses, donkeys and camels are used to perform various tasks for us.
- Muscular force can be applied only when it is in contact with an object, is also called a contact force.
- Example: Friction: The force responsible for changing the state of motion of objects in all these examples is the force of friction.
- The force of friction always acts onall the moving objects and its direction is always opposite to the direction of motion.
- Since the force of friction arises due to contact between surfaces, it isalso an example of a contact force.

- **Non-contact force:**

- Attraction or repulsion between objects is also a type of non-contact force.
- Magnet are a type of force which act without being in contact with one another.
- It is a non-contact force.
- The force exerted by amagnet on a piece of iron is also a non contact force

I. Electrostatic Force:

- The force exerted by a charged body on another charged or uncharged body is known as electrostatic force.
- This force comes into play when the bodies are not in contact.
- The electrostatic force is example of a non-contact force.

II. Gravitational Force:

- It is an attractive force that acts on all object.
- Things fall towards the earth because it pulls them.
- This force is called the force of gravity.
- Every object in the universe exerts a force on every other object and is known as the gravitational force.

III. Pressure:

- Pressure is the force per unit area.
- Pressure is calculated with the forces which act perpendicular to the surface.
- For a smaller the area, larger the pressure on a surface for the same force.
- Gases and other liquids exert pressure on the walls of their container'

- **Atmospheric Pressure:**

1. Air envelope around the earth is the atmosphere.
2. The pressure exerted by this air is known as atmospheric pressure.
3. The force of gravity on the air is the atmospheric pressure.