ENGINEERING MECHANICS

CONTENT

Concepts of Force

"An external agency either push or pull which changes or tends to change the state of rest or of uniform motion of a body, upon which it acts."

Or

Definition of Force

"Force is the product of mass and acceleration."

(As per Newton's second law of motion)

Mathematically,

$$\mathbf{F} = m \times a$$

Force = mass × acceleration

S.I. Unit of force,

$$\mathbf{F} = m \times a$$

$$F = Kg \times \frac{m}{s^2}$$

F = N (Newton)

$Kg \times \frac{m}{s^2}$ term is called **Force.**

Important Unit

1. 1 KN = 1×10^3 N (KN – kilo-newton)
2. 1 MN = 1×10^6 N (MN – Mega-newton)
3. 1 GN = 1×10^9 N (GN – Gega-newton)

Graphical Representation (Force)

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Characteristics of Force

1. Magnitude
2. Direction
3. Point of application
4. Sense or Nature
   - i. Pull
   - ii. Push

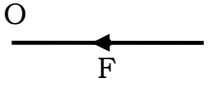
1. **Magnitude:** The quantity of force. **Example,** 10N, 15 KN
2. **Direction:** The direction of the line along which the force.
3. **Point of application:** The point at which the force acts on the body.

4. **Sense or Nature:**

   i. **Pull:** "If the arrow head is pointed away "

"Pull"

   ii. **Push:** "If the arrow head is pointed towards the point of application, is called as push."



"Push"