insta : razdaan--

Chapter#05

⊙ Newton's 1st Law → at rest so at rest
→ moving with uniform velocity so keeps moving with uniform velocity
→ as uniform velocity → no change in velocity so acceleration = 0
i.e. $\vec{a} = 0$ (∵ velocity = constant)
net external force → $\Sigma F = 0$

M.F
$\vec{F}_{net} = 0 \Rightarrow \vec{a} = 0$

⊙ Newtons 2nd Law of motion: → acceleration is directly proportional to the net external force acting on it and inversely proportional to its mass.
→ direction of acc. = direction of force

M.F
$a = \frac{F}{m} \rightarrow F = ma$ (more mass → less acceleration and vice versa)
$\Rightarrow a = F_{net}/m$ (not F_x or F_y only)

⊙ Newtons 3rd Law of motion: → for every action, there is an equal and opposite reaction
→ Force in pair
M.F
$F_{AB} = -F_{BA}$

→ F_{AB} = force exerted on A by B

⊙ Force → Newton → N → vector quantity.
⊙ net force = resultant force
↳ add forces as vectors.
⊙ acceleration = second derivative of displacement (x) w.r.t. time t
⊙ inertial frame of reference = is the one in which newton's laws holds.
⊙ Resolve force into its components → $F_{netx} = ma_x$, $F_{nety} = ma_y$, $F_{netz} = ma_z$

⊙ stationary → $F_{net} = 0$
⊙ const velocity → $F_{net} = 0$
⊙ $\vec{a} = 0$ so $F_{net} = 0$

$F_1 + F_2 = 0$
$F_1 + F_2 + F_3 + \dots = 0$

⊙Equilibrium then $F_{net} = 0$ (like newton's first of motion)

⊙Free Body Diagram (FBD): is a sketch that isolates a single object (or system) and shows all external forces acting on it as vectors.
↳ essential step for applying formulas like $\Sigma F = ma$
↳ make the problem visual & reduce mistakes.
↳ add external force only like for obj A add force acting on A (not the reaction force by A)
↳ include external forces only.

⊙Weight → magnitude of Force (gravitational) on the body
↳ $W = |F_g| = mg$

⊙Normal Force → perpendicular to surface
↳ ex. Book on table
↳ book on table (force applying)
↳ table applying normal force which is normal to table i.e. ⊥ to table

⊙Frictional force: → resisted → opposition

⊙Tension → cord, rope, cable, etc → attached to body.
Force: ↳ away from the object.

- W (Worng) → always points straight down towards the center of Earth.
- Tension (T) → a pulling force exerted by rope, string or cord
  ↳ acts along direction of rope, away from Objec
- Normal F (N) → contact force from a surface that is perpendicular to the surface.
- Friction (f) → contact force that opposes motion or attempted motion → acts parallel to the surface.

1) Draw Free body diagram (FBD)
2) Choose coordinate system
3) Apply $\Sigma F = ma$ (Newton's 2nd Law)
   - ↳ $\Sigma F_x = ma_x$
   - ↳ $\Sigma F_y = ma_y$

↳ if in equilibrium (not accelerating) then $a_x = 0$, $a_y = 0$
So then
$$\Sigma F_x = 0$$
$$\Sigma F_y = 0$$

mai tu distract ho gaya ap log no hona

So → Acha se parho or cha jao