

we cannot produce a single isolated force in nature force are always produce in action - reaction pair.

- due to no time gap. any one force can be action, and other reaction.
- applicable for all the interactive forces eg. Gravitational. electrostatic. electromagnetic. TENSION, Friction, VISCOUS FORCES, etc.

- Condition of ossillation ($O < u \le \sqrt{2gR}$)
- 2. Particles moves to upper half circle but not able to complete the loop. Condition of leaving the circle: $(\sqrt{2gR} < u < \sqrt{5gR})$

3. Particle completes loop. Condition of looping the loop $(u \ge \sqrt{5gR})$

For Non - inertial frame

 $\vec{F}_{ext} + \vec{F}_{Pseudo} = m\vec{a}$

 $F_{pseudo} = -Ma_{fram}$



SOLVING PROBLEMS IN MECHANICS

- · Draw FBD of bodies in the system.
- · Choose a convenient part of the assembly as one system.
- Identify the unknown force and accelerations.
- Resolve forces into their Components.
- Apply $\sum \vec{F} = m\vec{a}$ in the direction of motion.
- Apply $\sum \vec{F} = O$ in the direction of equilibrium
- Write constraint relation if exists.
- Solve the equation $\sum \vec{F} = m\vec{a} \& \sum \vec{F} = O$.







sin AY

 $rg(\mu + tan \theta)$

 $1 - \mu \tan \theta$

 $|Rg(tan \theta - \mu)|$

 $(1+\mu \tan \theta)$

 $V = \sqrt{rg} \tan \theta$



$$max \leq \sqrt{\mu_s} Rg$$

o a

MOTION OF A CAR ON BANKED ROAD

(i) Optimum speed of a vehicle on a banked road.

maximum safe speed on a banked frictional road. $V_{\rm max} {=}$

minimum safe speed on a banked frictional road

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