$T_A - T_C = 6mg$	$T_A - T_D = 3mg$
$T_A - T_B = 3mg$	$T_B - T_D = 0$

- If reference point is at 'A' for potential then $\boxed{\text{Total ME} = \frac{5}{2}MgR}$

- Work done by tension = 0
- In case of critical condition $\boxed{V = \sqrt{5gR}}$
- If $\boxed{0 < V \leq \sqrt{2gR}}$ → oscillate

$\theta_{max} \leq 90^\circ$; At extreme : $T \neq 0$; $V = 0$

$\boxed{V_0 = \sqrt{gR} \; ; \; \theta_{max} = 60^\circ}$

$\boxed{V_0 = \sqrt{2gR} \; ; \; \theta_{max} = 90^\circ}$

- If $\boxed{\sqrt{2gR} \leq V_0 \leq \sqrt{5gR}}$ → Parabola

at θ_{max} $V \neq 0$; $T = 0$

$\boxed{90^\circ < \theta_{max} < 180^\circ}$

- If $\boxed{V_0 = \sqrt{5gR}}$ critical velocity to complete vertical circle.
- If rod / ring $\boxed{V_0 = \sqrt{4gR}}$ → to complete VCM

(Q) (1)

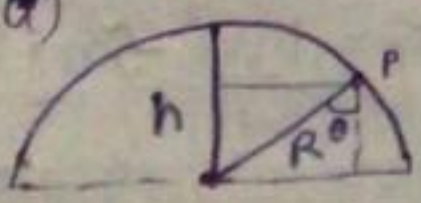
- Rope tuthe ki possibility at lowest point is maximum. ↓ $\boxed{T = max}$

$\boxed{T_L = 6mg \; ; \; T_H = 0}$

18) Partical leaving contact with semisphere

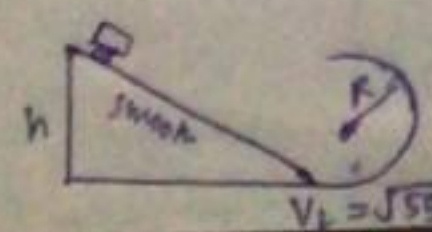
$\boxed{\cos\theta = \frac{h}{R}}$ $\boxed{h = \frac{2r}{3}}$

a)

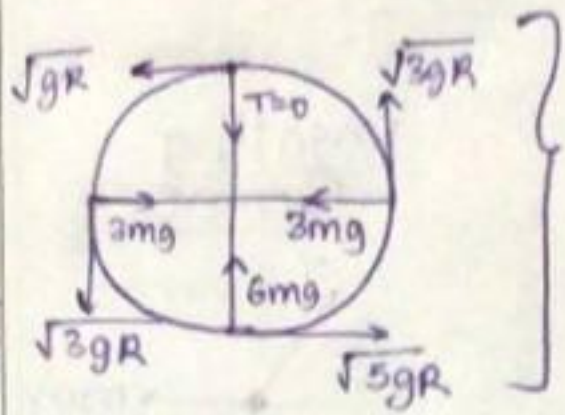


$\boxed{V_p = \sqrt{2gR[1-\cos\theta]}}$

b)



$\boxed{h = \frac{5R}{2}}$ → vcm complete



For string :
Highest Point :-
$T = 0$; $V \neq 0$
For Rod :
Highest Point
$T \neq 0$; $V = 0$



$\boxed{\theta = \cos^{-1}\frac{2}{3}}$

19) Relative Angular Velocity

(ω) → depends on position of observer
→ as well as FOR

$\boxed{\omega = \frac{V_\perp}{r}}$ → Radius nhi hai

r → dist b/w object & observer.

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