GRAVITATION

ESCAPE SPEED

Escape velocity (v_e):

Minimum velocity required for an object at earth's surface so that it just escapes the earth's gravitational field.

Escape energy

Minimum energy given to a particle in form of K.E. so that it can just escape from earth's gravitational field.

Escape energy = $\frac{GM_em}{R_e}$ (-ve of PE of earth's surface)

Escape energy = K.E.



$$V_{e} = R_{e} \sqrt{\frac{8\pi G.\rho}{3}}$$
 (In form density) If ρ = constant $V_{e} \propto R_{e}$

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Important Points

- (1) Escape velocity does not depend on mass of body, angle of projection or direction of projection, $V_e \propto m^0$ and $V_e \propto \theta^{\varrho}$
- (2) Escape velocity at earth surface $V_e = 11.2$ km/sec. Escape velocity at moon surface $V_e = 2.31$ km/sec.
- (3) Atmosphere on moon is absent because root mean square velocity of gas particle is greater than escape velocity $V_{rms} > V_e$