$T = \frac{t}{N} = \frac{24h}{10 \text{ voltes}} = 2{,}4\,h = 8640\,s$. període de GPS.

$m = 150\,kg$.

(a) $\omega = \frac{2\pi}{T} = \frac{2\pi}{8640\,s} = \boxed{7{,}27 \times 10^{-4}\ \frac{rad}{s}}$. Velocitat angular

$$r = \sqrt[3]{\frac{GM_T}{4\pi^2} \cdot T^2} = \sqrt[3]{\frac{6{,}67 \times 10^{-11} \cdot 5{,}98 \times 10^{24}}{4\pi^2} \cdot (8640)^2} = 9{,}10 \times 10^6\ m.$$

$h = r - R_T = 9{,}10 \times 10^6 - 6{,}38 \times 10^6 = \boxed{2{,}7 \times 10^6\ m}$. altura.

(b) Energia mecànica:

$$E_M = -\frac{1}{2}\frac{GM_T}{r} = -\frac{1}{2}\frac{6{,}67 \times 10^{-11} \cdot 5{,}98 \times 10^{24}}{9{,}10 \times 10^6} = \boxed{-2{,}19 \times 10^7\ J}$$

Velocitat lineal:

$$v = \frac{2\pi r}{T} = \frac{2\pi\, 9{,}1 \times 10^6}{8640} = \boxed{6617\ m/s}$$

(c) Si $r = 2 \cdot 9{,}1 \times 10^6 = 1{,}82 \times 10^7\ m$.

$$T = \sqrt{\frac{4\pi^2}{GM_T} r^3} = \sqrt{\frac{4\pi^2 (1{,}82 \times 10^7)^3}{6{,}67 \times 10^{-11} \cdot 5{,}98 \times 10^{24}}} = \boxed{24427\,s} = 6{,}78\,h.$$

La nova velocitat:

$$v = \frac{2\pi r}{T} = \frac{2\pi\, 1{,}82 \times 10^7}{24427} = \boxed{4682\ m/s}$$