Solution

We have weight of man in surface od Earth ***P=710N***, from hence mass of man is ***m=72.38kg.***

We have an equation of motion on x- and y- axis's (launch angle is α, v_0 is magnitude of initial speed)

$$x = v_0 t \cos\alpha$$
$$y = v_0 t \sin\alpha - g\frac{t^2}{2} \quad .$$

From hence we get about flight time $t = \frac{2v_0 \sin\alpha}{g} = 2.3s$, distance of flight

$$l = \frac{2{v_0}^2 \cos\alpha \sin\alpha}{g} = 35m\,.$$

From hence, we get launch angle $\tan\alpha = \frac{gt^2}{2l} = 0.741$

From hence we get $v_0 = \frac{gt}{2\sin\alpha} = \frac{gt}{2}\sqrt{1+\tan^{-2}\alpha} = 18.92m/s$

We have that the in canon

$$mv_0 = \Delta t\left(F - F_f - mg\sin\alpha\right)$$
$$F_f = 405N$$
$$\Delta t = 0.6s,$$
$$mg\sin\alpha = 422{,}7N$$
$$F = 3110N$$

Answer:

A) $v_0 = 18.92m/s$

B) $\tan\alpha = \frac{gt^2}{2l} = 0.741$

C) $F = 3110N$