

HOMEWORK

1) A 5 kg body collides with a 20 kg body & exerts 20 N force on it. So force exerted by 20 kg body on 5 kg body is :-

Ans) 20 N.

2) A man of mass 50 kg is pulling (being suspended from it) a light rope suspended from a roof. By what force the rope is pulling the roof?

Ans) $F = mg$ [$g = \text{acc}^n$ due to gravity]

$$\Rightarrow F = 50 \times 10$$

$$\Rightarrow F = 500 \text{ N}$$

3) A man of mass 50 kg is pulling a rope of mass 5 kg suspended from a roof. By what force the rope is pulling the roof?

Ans) $F = mg$ [$g = \text{acc}^n$ due to gravity]

$$\Rightarrow F = 5 \times 10$$

$$\Rightarrow F = 50 \text{ N}$$

4) A pendulum bob of mass 50 g is suspended from the ceiling of an elevator. Find the tension in the string if the elevator

c) goes up with acc^n 1.2 m/s^2

$$\Rightarrow T = m(g+a)$$

$$\Rightarrow T = \frac{50}{1000} (9.8 + 1.2)$$

$$\Rightarrow T = 0.55 \text{ N.}$$

d) goes up with deceleration 1.2 m/s^2

$$\Rightarrow T = m(g-a)$$

$$\Rightarrow T = \frac{50}{1000} (9.8 - 1.2)$$

$$\Rightarrow T = 2.43 \text{ N.}$$

e) goes up with uniform velocity.
velocity constant = acc^n zero.

$$\Rightarrow T = \frac{50}{1000} \times 9.8 = 0.49 \text{ N.}$$

f) goes down with acc^n 1.2 m/s^2

$$\Rightarrow T = \frac{50}{1000} \times (9.8 - 1.2)$$

$$\Rightarrow T = 0.43 \text{ N.}$$

4) goes down with $\text{acc}^n 1.2 \text{ m/s}^2$

$$\Rightarrow T = \frac{50}{1000} \times (9.8 + 1.2)$$

$$\Rightarrow T = 0.55 \text{ N.}$$

4) goes down with uniform velocity.

velocity constant = acc^n zero.

$$\Rightarrow T = \frac{50}{1000} \times 9.8$$

$$\Rightarrow T = 0.49 \text{ N.}$$

5) A monkey of mass 40 kg climbs on a rope which can stand a maximum tension of 600 N. In which of the following cases will the rope break: the monkey

Ans) a) $T = m(g + a)$

$$\Rightarrow T = 40(10 + 6)$$

$$\Rightarrow T = 40 \times 16$$

$$\Rightarrow T = 640 \text{ N.}$$

$T > T_{\text{max}}$ the rope will break in this case.