Homework →

① A pendulum bob of mass 50g is suspended from the ceiling of an elevator, Find the tension in the string if the elevator

(a) goes up with acceleration 1.2 m/s^2.

Ans → Given, Mass = 50 kg

Acceleration (a) = 1.2 m/s^2

$T - mg = ma$

$T = m(g+a)$

a is upward.

$T = m(g+a)$

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

$T = 0.55 \, N$

(b) Goes up with deceleration 1.2 m/s^2.

Ans →

$T = m(g-a)$

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

$T = 0.43 \, N$

(b) Goes up with uniform velocity.

Ans → $T = mg$

$T = \dfrac{50}{1000} \times 9.8$

$T = 0.49 \, N$

(d) Goes down with acceleration 1.2 m/s^2

Ans → $T = mg - ma$; $T = m(g-a)$

Homework →

① A pendulum bob of mass 50g is suspended from the ceiling of an elevator, find the tension in the string if the elevator

(a) goes up with acceleration $1.2 \, m/s^2$.

Ans→ Given, Mass = 50 kg
Acceleration (a) → $1.2 \, m/s^2$

$$T - mg = ma$$
$$T = m(g+a)$$

a is upward.
$$T = m(g+a)$$
$$T = \frac{50}{1000}(9.8 + 1.2)$$

$$T = 0.55 \, N$$

(b) Goes up with deceleration $1.2 \, m/s^2$

Ans→
$$T = m(g-a)$$
$$T = \frac{50}{1000}(9.8 - 1.2)$$

$$T = 0.43 \, N$$

(c) Goes up with uniform velocity.

Ans→
$$T = mg$$
$$T = \frac{50}{1000} \times 9.8$$

$$T = 0.49 \, N$$

(d) Goes down with acceleration $1.2 \, m/s^2$

Ans→ $T = mg - ma$: $T = m(g+a)$

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

$T = 0.43 \, N$

(2) $\cancel{goass}$ goes down with decceleration $1.2 \, m/s^2$

→ $T = m(g+a)$

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

$T = 0.55 \, N$

(3) goes down with uniforma velocity.

→ $T = mg$

$T = \dfrac{50}{1000} \times 9.8$

$\cancel{T}$ $T = 0.49 \, N$

① A 5kg body collides with a 20 kg body & enerts 20 N force on it. So, force enerted by 20 N body on 5 kg body is

→ (c) 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.

→ Mass of the man = 50 kg

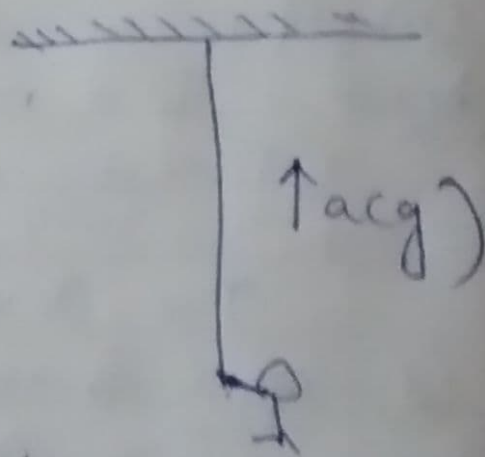· Acceleration due to gravity

$F = mg$

$= 50 \times 9.8$

$= 490 \, N$

∴ 490 N

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

Ans→ Mass of the man = 50 kg

Mass of the rope = 5 kg

→ $F = ma$

here, a = accel due to gravity (g)

$F = mg$ [mass = mass of man + mass of rope]

→ $F = (50+5) \times 9.8$

$F = 55 \times 9.8$

$= 539 \ N$

∴ 539 N.

A monkey of mass 40 kg climbs on a rope [as shown in fig7] which can stand a maximum tension of 600 N. In which of the following cases will the rope break, the monkey,

→ (X) uniform climbs up with a uniform speed of 5 m/s

Ans → (a) climbs up with an acceleration of 6 m/s².