H/W

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 5kg body is :-

Ans) 20 N (c) (✓)

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 = accl^n due to gravity].

$\Rightarrow F = 50 \times 10$

$\Rightarrow F = 500\,N$. (Ans).

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

Ans) $F = mg$ [g = accl^n due to gravity].

$\Rightarrow F = 5 \times 10$

$\Rightarrow F = 50\,N$. (Ans).

Q) 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 acc^{n} $1.2\ m/s^2$

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

$\Rightarrow T = 50/1000(9.8+1.2)$

$\Rightarrow T = 0.55\ N$

b) goes up with deceleration $1.2\ m/s^2$.

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

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

$\Rightarrow T = \quad = 0.43\ N.$

c) goes up with uniform velocity.

Ans) velocity const. = acc^{n} zero.

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

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

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

$\Rightarrow T = 0.43\ N.$

e) goes down with accln $1.2 m/s^2$.

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

$\Rightarrow T = 0.55 N$.

f) goes down with uniform velocity.

Any Velocity const. = accln zero.

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

$\Rightarrow T = 0.49 N$.

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

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

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

$\Rightarrow T = 640 N$.

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