8. Newton's Third Law tells us that for every action (force) there is an equal but *opposite* reaction (force).

C is the answer.

9. Mass is defined as the quantitative measure of an object's inertia.

A is the answer.

10. $\vec{F}_{net} = m\vec{a}$

If we know the net force and the acceleration, we see from Newton's Second Law that we can determine the mass.

D is the answer.

11.

$\vec{F}_f = 48\text{ N}$ ← [ ] → $\vec{F}_T = 105\text{ N}$

$$\begin{aligned} F_{net} &= F_T - F_{fr} \\ &= 105\text{ N} - 48\text{ N} \\ &= 57\text{ N} \\ F_{net} &= ma \\ a &= \frac{F_{net}}{m} \\ &= \frac{57\text{ N}}{95.0\text{ kg}} \\ &= 0.600\text{ m/s}^2 \end{aligned}$$

B is the answer.

12.

[ ] → F

$$\begin{aligned} F &= F_g \\ &= mg \\ &= (7.5\text{ kg})(9.81\text{ m/s}^2) \\ &= 76.36\text{ N} \\ F_{net} &= F_g = ma \\ a &= \frac{F_{net}}{m} \\ &= \frac{73.5\text{ N}}{10.5\text{ kg}} \\ &= 7.0\text{ m/s}^2 \end{aligned}$$

Note: Must add the two masses

C is the answer.

13.
$$\begin{aligned} F_g &= mg \\ m &= \frac{F_g}{g} \\ &= \frac{12.0\text{ N}}{9.81\text{ m/s}^2} \\ &= 1.22\text{ kg} \end{aligned}$$

B is the answer.

14.

$\vec{v}_0$	$\vec{v}$	$\vec{a}$	$\vec{d}$	t
22 m/s	0	?		9.0 s

$$\begin{aligned} \vec{a} &= \frac{\vec{v} - \vec{v}_0}{t} \\ &= \frac{0 - 22\text{ m/s}}{9.0\text{ s}} \\ &= -2.44\text{ m/s} \\ \vec{F}_{net} &= m\vec{a} \\ &= (1.2\times10^3\text{ kg})(-2.44\text{ m/s}^2) \\ &= -2.9\times10^3\text{ N} \end{aligned}$$

D is the answer.

15.

$$\begin{aligned} F_g &= mg \\ &= (3.0\text{kg})(9.81\text{ m/s}^2) \\ &= 29.4\text{ N} \\ F_{net} &= F_T - F_g \\ &= 55\text{ N} - 29.4\text{ N} \\ &= 25.6\text{ N} \end{aligned}$$

$$\begin{aligned} F_{net} &= ma \\ a &= \frac{F_{net}}{m} \\ &= \frac{25.6\text{ N}}{3.0\text{ kg}} \\ &= 8.5\text{ m/s}^2 \end{aligned}$$

A is the answer.

