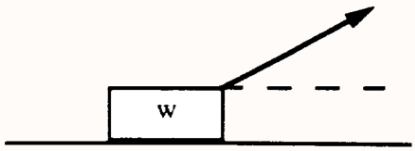
No. 1



A block of weight W is pulled along a horizontal surface at a constant speed by a force F, which acts at an angle θ with the horizontal, as shown above. The normal force exerted on the block by the surface has magnitude of

(A) $W - F\ \cos(\theta)$

(B) $W - F\ \sin(\theta)$

(C) W

(D) $W + F\ \sin(\theta)$

(E) $W + F\ \cos(\theta)$

No. 2

Select the scalar quantity from the following list.

(A) acceleration

(B) displacement

(C) force

(D) mass

(E) velocity

No. 3

An elevator weighing 12 000 N is accelerating upward. The tension in the cable is 20 000 N and the frictional resistance to motion is 5 000 N. The unbalanced force on the elevator is

(A) 37 000 N (up)

(B) 27 000 N (up)

(C) 13 000 N (up)

(D) 8 000 N (up)

(E) 3 000 N (up)

No. 4

The mass of an object is a measure of its

(A) acceleration

(B) momentum

(C) weight

(D) inertia

(E) impulse

No. 5

A paratrooper predicts that objects have less weight at high altitudes. He tests this prediction by using a spring scale calibrated in newtons to weigh a mass of one kilogram while falling from an altitude of 5000 m. ($g = 10\ m/s^2$)

What will the spring scale read during the first second of fall and before the parachute opens?

(A) 0

(B) 0.10 N

(C) slightly less than 10 N

(D) 10 N

(E) slightly more than 10 N

No. 6

A water skier is being pulled by a boat at a constant speed v. The tension in the cable pulling the skier is T. The force exerted on the skier by the water would be

(A) T

(B) $T\ v$

(C) $2\ T$

(D) $\frac{T}{2}$

(E) $10\ v$