Name _____

Date _____

ISTANBUL INTERNATIONAL COMMUNITY SCHOOL
IICS SINCE 1911

Forces I

1. What net external force is required to push a 45 kg suitcase with an acceleration of 3.5 $m \cdot s^{-1}$ to the right? Draw a free-body diagram of the suitcase.

2. What acceleration will you give to a 60 kg box if you push it with a force of 147 N?

3. An 1520 kg car is moving to the right at a constant velocity of 5.94 $m \cdot s^{-1}$.

   A. What is the net force on the car?

   B. What would be the net force on the car if it were moving to the left?

4. A freight train has a mass of 4.5 x 10^7 kg. If the locomotive can exert a constant pull of 10.5 x 10^5 N, how long would it take to increase the speed of the train from rest to 85 $km \cdot h^{-1}$?

5. A 32 kg mass starts from rest and slides down an inclined plane 8.0 10-1 m long in 0.8 s. What net force is acting on the mass along the incline?

6. A 1350 kg car is pulling a 475 kg trailer. Together, the car and trailer have an acceleration of 2.15 $m \cdot s^{-2}$ directly forward.

   A. Determine the net force on the car.

   B. Determine the net force on the trailer.

7. Which one of the following objects is in equilibrium?

   A. A stone trapped in the tread of a rotating tyre

   B. An air molecule as a sound wave passes through the air

   C. A steel ball falling at constant speed through oil

   D. An electron moving through a metal under the action of a potential difference

8. For an object to be in translational equilibrium

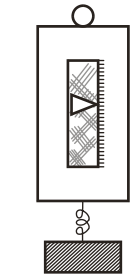
   A. it must be at rest.

   B. it must be moving with a constant acceleration.

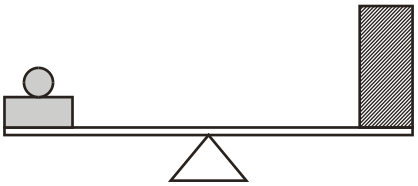
   C. no external force must be acting on it.

   D. the net force acting on it must be zero.

9. The weight of a mass is measured on Earth using a spring balance and a lever balance, as shown below.



spring balance



lever balance

What change, if any, would occur in the measurements if they were repeated on the Moons surface?

	Spring Balance	**Lever Balance**
A.	same	unchanged
B.	same	decreases
C.	decrease	same
D.	decrease	decrease