

# Ayman Ghannam

## Chapter 5&6 “Force and Motion I&II”

1- A 70-kg man stands on a spring scale in an elevator that has a downward acceleration of  $2.8 \text{ m/s}^2$ . The scale will read: (A: 490 N)

2- A person pulls a 50-kg box horizontally with a constant horizontal force of 200 N. If the coefficient of kinetic friction  $\mu_k$  is 0.2 and the coefficient of static friction ( $\mu_s$ ) is 0.3. Find the acceleration of the box. (A:  $2 \text{ m/s}^2$ )

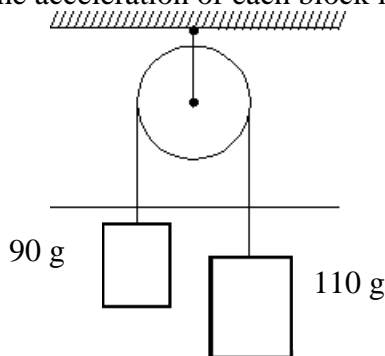
3- A block of mass  $M = 10 \text{ kg}$  is pushed up along a  $30^\circ$  inclined plane with a force  $F$  parallel to the inclined plane. If the velocity of the block is constant and the coefficient of kinetic friction  $\mu_k$  is 0.2, find the magnitude of the force. (A: 66 N)

4- One end of a 1.0-m string is fixed; the other end is attached to a 2.0-kg stone. The stone swings in a vertical circle, and has a speed of 4.0 m/s at the top of the circle. The tension in the string at this point is approximately: (A: 12 N)

5- A 3.5-kg block is pulled at constant velocity along a horizontal floor by a force  $F = 15 \text{ N}$  that makes an angle of  $40^\circ$  with the horizontal. Find the magnitude of the force of friction between the block and the floor. (A: 11 N)

6- Find the minimum coefficient of static friction between the tyres of a car and a level road if the car is to make a circular turn of radius 90 m at a speed of 60 km/h. (A: 0.315)

7- Two blocks are connected by a string and pulley as shown. Assuming that the string and pulley are massless, the magnitude of the acceleration of each block is: (A:  $0.98 \text{ m/s}^2$ )



8- Block A, with a mass of 10 kg, rests on a  $35^\circ$  incline. The coefficient of static friction is 0.40. An attached string is parallel to the incline and passes over a massless, frictionless pulley at the top. What is the smallest mass  $m_B$ , attached to the dangling end, for which A remains at rest? (A: 2.5 kg)

