

Phys11 Dynamics : Test - 80

- 1) Write down Newton's three laws.
- 2) Which has more inertia, a car or a truck ?
- 3) Define : Weight -
- 4) If your mass is 65 kg, what is your weight ?
- 5) A bicycle has a mass 75 kg (including the rider). Find the force required to accelerate the bike and rider at 1.5 m/s^2 .
- 6) A 15 gram snail goes from rest to 5.0 mm/second in 4.0 sec. Find the force the ground exerts on the snail.
- 7) A net force of 45 N acts on a mass of 5.0 kg. Find the acceleration.
- 8) An empty truck has a mass of 2500 kg. It has a maximum acceleration of 1.5 m/s^2 . Find the acceleration if the truck carries a load of 750 kg.
- 9) A 1500 kg car has an initial speed of 8.0 m/s. Find the force required to stop the car in a distance of 35 m.
- 10) A sky-diver has a mass of 62 kg. The air resistance force is 180 N [up]. The net force is _____. His acceleration is _____.
- 11) A shot putter exerts an unbalanced force of 210 N on a shot put giving it an acceleration of 8.5 m/s^2 . The mass is _____.
- 12) How much force is needed to accelerate a 5.0 g bullet from rest to 950 m/s over a distance of 65 cm ? (use $V_f^2 - V_i^2 = 2ad$)
- 13) A catcher catches a baseball that was traveling at 35 m/s. If the glove of the catcher moves back 18 cm from the time of contact to the time the ball comes to rest find stopping force if the ball has a mass of 0.25 kg.

14) A 7.2 kg rifle has a barrel 85 cm long. It fires a 57 g bullet with a muzzle velocity of 850 m/s. Find the reaction force on the rifle.

15) A 6500 kg helicopter has a 1500 kg car suspended below it by a cable. It accelerates upward at 0.40 m/s^2 . The force the air exerts on the propellers is _____. The force the propellers exert on the air is _____. The tension in the cable is _____.

Answers : 1) i) If the net force on an object is zero, the velocity is constant. ii) The net force on an object equals the mass multiplied by the acceleration. iii) For every action there is an equal and opposite reaction. visit www.mrowen.com 2) The truck. It has more mass. 3) It is the force of gravity. 4) -640 N, 5) 110 N, 6) $1.9 \times 10^{-5} \text{ N}$, 7) 9.0 m/s^2 , 8) 1.2 m/s^2 , 9) -1400 N, 10) -430 N, -6.9 m/s^2 , 11) 25 kg, 12) 3500 N, 13) -850 N, 14) $-2.4 \times 10^4 \text{ N}$, 15) $+8.2 \times 10^4 \text{ N}$, $-8.2 \times 10^4 \text{ N}$, $1.5 \times 10^4 \text{ N}$.