Laws Of Motion

1. What force is required to produce an acceleration of $2ms^{-2}$ in a body of mass 0.8 kg?
2. A force acts for 0.1 s on a body of mass 1.2kg initially at rest. The force then ceases to act and the body moves through 2 m in the next one second. Find the magnitude of force.
3. A body of mass 500g is resting on a frictionless table. Calculate the acceleration of body when it is acted upon by a force of 0.01N.
4. A ball of mass 10g is initially moving with a velocity of 50 m s^{-1}. On applying a constant force on ball for 2.0s, it acquires a velocity of 70m s^{-1}. Calculate:
   (i) the initial momentum of ball
   (ii) the final momentum of ball
   (iii) the rate of change of momentum
   (iv) the acceleration of ball, and
   (v) the magnitude of force applied.
5. A circket ball of mass 100g moving with a speed of 30 m s^{-1} is brought to rest by a player in 0.03s. Find.
   (i) the change in momentum of ball.
   (ii) the average force applied by the player.
6. Calculate the gravitational force of attraction between the two bodies of masses 40kg and 80kg separated by a distance 15m. Take G= 6.7×10^{-11} N m^2 kg^{-2}.
7. Taking the mass of earth equal to 6×10^{24} kg and radius of earth equal to 6.4×10^{6} m, calculate the value of acceleration due to gravity at a height of 2000km above the earth surface. Take G = 6.7×10^{-11}N m^2kg^{-2}.
8. A body of mass 10kg is taken from the earth to the moon. If the value of g on the earth is 9.8 ms^{-2} and on the moon is 1.6 m s^{-2}, find:
   (i) the weight of the body on earth, (ii) the mass and weight of the body on moon.
9. A ball is thrown vertically upwards from the top of building of height 24.5m with the initial velocity 19.6ms^{-1}. Taking g = 9.8m s^{-2}, Calculate (i) the height to which it will rise before returning to the ground (ii) the velocity with which it will strike the ground, and (iii) the total time of journey.