LAWS OF MOTION

1. Give the magnitude and direction of the net force acting on (a) a drop of rain falling down with a constant speed (b) a cork of mass 10 g floating on water.
2. A cricket player while catching the ball, pulls his hand back.Why?
3. Why does a gun recoil? Derive the recoil velocity of a gun.
4. Explain why (a) a horse cannot pull a cart and run in empty space. (b) passengers are thrown forward from their seats when a speeding bus stops suddenly.
5. Action and reaction are equal and opposite.Why do they not balance each other?
6. A mass m is at rest on a rough surface.Draw the variation of the force of friction experienced with the force applied on it.
7. A man of mass 70 kg stands on a weighing scale in a lift which is (a) moving upwards with a uniform speed of 10 m/s (b) moving down with a uniform acceleration of 5 m/s^2 (c) freely falling under gravity.
8. A machine gun has a mass of 20 kg.It fires 35 g bullets at the rate of 400 bullets per second with a speed of 400 m/s. What force must be applied to the gun to keep it in position?
9. Two masses 8kg and 12 kg are connected at the two ends of a light inextensible string that goes over a frictionless pulley.Find the acceleration of the masses and the tension in the string when the masses are released.
10. Give some ways by which we can reduce friction.