LONG ANSWER TYPE QUESTIONS

(FORCE & LAWS OF MOTION)

1. State and prove law of conservation of momentum in case of two bodies of masses m_1 and m_2 collide each other

2. Define Inertia . What does it depends on ? using this property explain a) remove dust from carpet b) remove water droplets from wet cloth ?

3. State Newton's three laws of motion . Calculate the magnitude of force required to produce an acceleration of 2 m/s^2 in a body of mass 12.5 kg

4. A bullet of mass 10 g travelling horizontally with a velocity of 150 m/s collides with and sticks to a stationary wooden block of mass 5 kg . Then they both move off together in the same straight line. Calculate the total momentum just before the impact and just after the impact. Also calculate the velocity of the combined objects .

5. With a neat diagram explain the working principle of a rocket In a rocket of mass 1000kg fuel is consumed at the rate of 40 kg/s .Calculate the velocity of the gas ejected from the rocket

6. Two equal masses 2 kg each moving with speed of 10 m/s and 5 m/s in opposite direction collide elastically. Find their velocities after collision

7. A motorcar of mass 1200 kg is moving along a straight line with a uniform velocity of 90 km/hr. Its velocity is slowed down to 18 km/hr in 4 s by an unbalanced external force . Calculate the acceleration and change in momentum. Also calculate the magnitude of the force required