Laws of Motion Important Questions

Here are some important questions from the topic "Laws of Motion" for Class 11 based on NCERT Physics:

Short Answer Type Questions:

1. **State and explain Newton's three laws of motion with examples.**
2. **What is inertia? Explain different types of inertia with examples.**
3. **Define momentum. State and prove the law of conservation of momentum.**
4. **What is impulse? Give the relation between impulse and momentum.**
5. **A bullet of mass 0.02 kg is fired from a gun of mass 10 kg with a speed of 200 m/s. Calculate the recoil speed of the gun.**
6. **Explain the concept of friction. Differentiate between static friction, kinetic friction, and rolling friction.**
7. **How does friction depend on the nature of the surfaces in contact?**

Long Answer Type Questions:

1. **Explain in detail the motion of a body under the action of several forces. How does Newton's second law of motion help in understanding it?**
2. **Derive the equations of motion for a block moving down an inclined plane under the effect of gravity and friction.**
3. **A 50 kg block is pulled with a force of 200 N along a rough surface with a coefficient of friction 0.4. Calculate the acceleration of the block.**
4. **Discuss the working of seat belts in cars based on Newton's first and second laws of motion.**
5. **What is uniform circular motion? Derive the expression for the centripetal force required for a body to perform uniform circular motion.**

Numerical Problems:

1. **A car of mass 1000 kg is moving with a speed of 72 km/h. It is brought to rest by applying brakes in 5 seconds. Calculate the force applied by the brakes.**
2. **Two blocks of masses 5 kg and 7 kg are connected by a light string passing over a frictionless pulley. The 5 kg block lies on a smooth table, and the 7 kg block hangs vertically. Find the acceleration of the system and the tension in the string.**
3. **A force of 20 N is applied to a block of mass 4 kg resting on a horizontal surface with a coefficient of kinetic friction 0.3. Find the acceleration of the block.**