Homework – Test-Style Questions

Q1. A planet has a mass of twice that of the Earth, and a radius of twice that of the Earth. What is the force of gravity of the planet, as compared to the force of gravity on Earth?

a. $2F_g$
b. F_g
c. $F_g/2$
d. $F_g/4$

Q2. A horizontal force of 30 N pulls a 2 kg block along a surface. If the block accelerates at 2 m/s^2, what is the frictional force on the block?

Q3. The coefficient of friction between a block and a surface is 0.1. If the block has a mass of 60kg and the surface is at 10 degrees to the horizontal, what is the force of friction?

Q4. A 50 N horizontal force is required to keep a 6kg object moving at a constant velocity. What is the coefficient of friction between the object and the surface?

Q5. Two planets are 3×10^{10} m apart. If the masses of the planets are 6×10^{24} kg and 15×10^{24} kg, what is the gravitational force between them?

Q6. A car of 600 kg moves in a circular path of radius 15 meters. If it moves at a constant speed of 5 m/s, calculate the magnitude of the force that keeps the car moving in a circle.

Q7. A 200 kg motorcycle is going up a hill of 40 degrees to the horizontal. The motorcycle applies a 10000 N force parallel to the slope and by doing so moves at a constant velocity. What is the value of the frictional force resisting the motion? And therefore what is the coefficient of kinetic friction between the motorcycle and the slope?