Worksheet: Laws of Motion

Maharashtra State Board · Class 11 · Physics · 10 questions · 31 marks

Name: _____	Date: _____	Score: _____ / 31

Q1. A 5 kg block is pulled by a 20 N horizontal force against 8 N of friction. Find its acceleration. *[2 marks]*

Q2. A book rests on a table. Name the third-law reaction to the weight of the book, and say why it is not the normal force from the table. *[2 marks]*

Q3. Why is it harder to start a heavy box moving than to keep it moving? *[2 marks]*

Q4. A 0.5 kg ball moving at 20 m/s is caught in 0.02 s. Find the average force on the hands. *[3 marks]*

Q5. A 4 kg gun fires a 20 g bullet at 400 m/s. Find the recoil speed of the gun. *[3 marks]*

Q6. A block slides down a 30 degree incline with mu_k = 0.2. Find its acceleration (g = 10 m/s^2). *[3 marks]*

Q7. A 1200 kg car turns a curve of radius 20 m at 15 m/s. Find the friction force required. *[3 marks]*

Q8. Find the maximum speed at which a car can round an unbanked curve of radius 50 m if mu_s = 0.5 (g = 10 m/s^2). *[3 marks]*

Q9. A road of radius 100 m is banked at 15 degrees, with mu_s = 0.2 between tyres and road. Find the optimum speed and the maximum permissible speed (g = 10 m/s^2, tan 15 = 0.268). *[5 marks]*

Q10. A 50 kg person stands on a weighing scale in a lift (g = 10 m/s^2). Find the scale reading when the lift (a) accelerates upward at 2 m/s^2, (b) moves up at constant speed, (c) accelerates downward at 2 m/s^2, and (d) falls freely. *[5 marks]*