

Test Paper
Subject : Physics
(Important Questions for Laws of Motion)

Q1. A man jumping out of a moving train falls with his hand forward. Why?

Q2. A block of mass 2kg is placed on a plane surface. The coefficient of static friction is 0.4. When a 2.8N force is applied on the block parallel to the surface, the force of friction between the block and surface.

Q3. A body of mass 3kg travels according to the law $x=at+bt^2+ct^3$ where $a=3 \text{ m/s}$, $b=4\text{m/s}^2$ $c=5 \text{ m/s}^2$. Calculate the force acting on the body at $t=2 \text{ sec}$.

Q4. the coefficient of friction between the two contact plane is $\sqrt{3}$. What is the angle of friction between those two planes?

Q5. In a circus, a motor cyclist goes round a circular track of radius r in a vertical plane. At the highest point on his track. What will be his minimum velocity?

Q6. A block of mass 10kg is sliding downwards on a inclined plane of angle 30° with horizontal. The coefficient of kinetic friction between the block and surface is 0.5. Find the acceleration of the block. ($g=9.8\text{m/s}^2$)

Q7. A circular race track of radius 300m is banked at an angle of 15° . If the coefficient of friction between the wheels of the race case and road is 0.2, find :

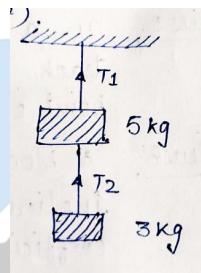
1. Optimum speed of the race car to avoid wear and tear on its tyres.
2. What is the maximum permissible speed to avoid slipping?

Q8. A 75kg man stands in a lift. What force does the floor exert on him when the elevator starts moving upwards with an acceleration of 2.0 m/s^2 . Take $g=10\text{m/s}^2$.

Q9. A person of mass 50kg stands on a weighing scale on a lift. If the lift is descending with a downward acceleration of 9m/s^2 . What would be the reading of the weighing scale? Take $g=10\text{m/s}^2$.

Q10. A car of mass 1000kg traveling at 32 m/s dashes into the rear of the truck of mass 8000kg moving in the same direction with a velocity of 4m/s. After the collision the car bounces with a velocity of 8 m/s. What is the velocity of the truck after the impact?

Q11. Two masses of 5kg and 3kg are suspended with the help of massless inextensible strings as shown in the figure below. Calculate T_1 and T_2 when the whole system is going upwards with acceleration $=2 \text{ m/s}^2$. (Use $g=9.8 \text{ m/s}^2$)



Q12. The velocity of a body of mass 2kg as a function of t is given by $v=2ti+t^2j$
Find the momentum and the force acting on it, at time $t=2\text{sec}$.

Q13. A body having mass of 0.4 kg is whirled in a vertical circle making 2 revolutions per second. If the radius of the circle is 1.2m. Find the tension in the string when the body is.

- a. At the top of the circle
- b. At the bottom of the circle.

*****7267871837,7905199925*****All The Best*****