



Test Paper- 02

Laws of Motion

General Instructions:

Answer all the questions. If you are unable to answer any question, go through the page number that is given against that particular question in the text book. You can find the answer.

MAX MARKS: 30

TIME: 90Mts 1

1. The motion of a particle of mass m is described by $y = ut + \frac{1}{2}gt^2$. Find the force acting on the particle.

[2]

2. Define impulse.

A batsman hits back a ball straight in the direction of the bowler without changing its initial speed of 12 ms^{-1} . If the mass of the ball is 0.15 kg , determine the impulse imparted to the ball (Assume linear motion of the ball) [3]

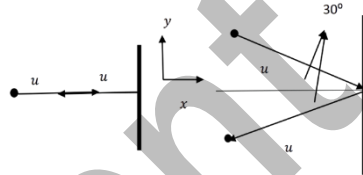
3. The earth pulls a stone downwards due to gravity. Does the stone exert a force on the earth. [2]

4. According to Newton's Third law of motion for every action there is an equal and opposite reaction. Do the action and reaction forces act on the same body. Explain. Also, state what is the effect of internal forces acting on the system? [3]

5. Two identical billiard balls strike a rigid wall with the same speed but at different angles, and get reflected without any change in speed as shown in fig. What is

(i). the direction of the force on the wall due to each ball?

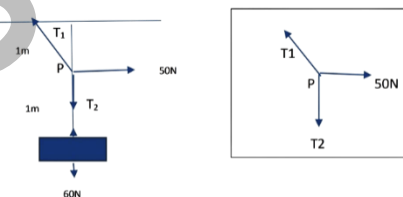
(ii). The ratio of the magnitudes of impulses imparted to the balls by the wall? [3]



6. State and prove the law of conservation of Momentum [3]

7. Under what conditions a particle is said to be in equilibrium. Explain [3]

8. A mass of 6 kg is suspended by a rope of length 2 m from the ceiling. A force of 50 N in the horizontal direction is applied at the mid-point P of the rope, as shown. What is the angle the rope makes with the vertical in equilibrium? (Take $g = 10 \text{ ms}^{-2}$). Neglect the mass of the rope. [2]



9. What is contact force? Give two examples in mechanics. [2]

10. What is the principle of working of a spring? [1]

11. What is tension in a string? [1]

12. What is meant by static frictional force? Give the factors on which the static frictional force depends upon. Also give the formula to find the limiting value of static friction. [2]

13. State the law of Kinetic Friction. How does it vary from law of Static friction? Give any two differences between static friction and kinetic friction. [3]