**Karan Arora** **R.L. Chemistry Classes M: 99968-68554**

**Max Time : 1 hr** **Class = 9th Science Test Max Marks : 30**

**FORCES AND LAWS OF MOTION**

1. Multiple choice questions : [ 1 X 6 = 6 ]
2. Which of the following is an equation for linear momentum?

|  |  |  |  |
| --- | --- | --- | --- |
| a) p = mv | b) F = ma | c) v – u = at | d) Ft = mv – mu |

1. When a branch of a tree is shaken, some of the fruits may fall down. This happens due to :

|  |  |
| --- | --- |
| a) Inertia of rest | b) Inertia of motion |
| c) Inertia of direction | d) None of the above |

1. An object of mass 2 kg is sliding with a velocity of 4m/s on a frictional horizontal surface. The retarding force necessary to stop the object in 1 second is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2 N | b) 8 N | c) 32 N | d) 0 N |

1. A goalkeeper in a game of football pulls his hands backwards while holding the ball shot at the goal. This enables the goalkeeper to :

|  |  |
| --- | --- |
| a) Exert larger force on the ball | b) Reduce the force exerted by the ball on hands |
| c) Increase the rate of change of momentum | d) Decrease the rate of change of momentum |

1. What is linear momentum of a toy car of mass 300 g, moving with a speed of 18 km/h.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.5 kg m/s | b) 3 kg m/s | c) 5.4 kg m/s | d) None |

1. The S.I. unit of linear momentum is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Newton | b) Dyne | c) kg m/s | d) g m/s |

1. Linear momentum of a particle is the product of \_\_\_\_\_ of the particle and its \_\_\_\_\_\_\_\_. [ 1 ]
2. Force is a \_\_\_\_\_\_\_\_\_\_ quantity. [ 1 ]
3. Impulse is the product of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_. [ 1 ]
4. Define 1 Newton force. [ 1 ]
5. Define inertia. [ 1 ]
6. Describe Newton’s Third law of motion. [ 1 ]
7. Describe balanced and unbalanced forces. [ 1 ]
8. When a carpet is beaten with the stick , dust comes out. Explain how? [ 2 ]
9. How much momentum will a dumb-bell of mass 10 kg transfer to the floor if it falls from a height of 80 cm? Take its downward acceleration to be 10 m/s2. [ 2 ]
10. Why does a cricket player moves his hand backward while catching the ball? [ 2 ]
11. Define newton’s First law and second law of motion. [ 2 ]
12. A force of 2 N when applies on a body increases its velocity from 8 m/s to 10 m/s in 5 sec. Find the mass of the body.

[ 2 ]

1. A truck starts from rest and rolls down a hill with a constant acceleration. It travels a distance of 400 m in 20 s. Find its acceleration. Find the force acting on it if its mass is 7 metric tonnes. [ 2 ]
2. A force of 5 N gives a mass m1, an acceleration of 10 m/s2 and a mass m2 , an acceleration of 20 m/s2. What acceleration would it give if both the masses were tied together? [ 2 ]
3. A 8000 kg engine pulls a train of 5 wagons, each of 2000 kg along a horizontal track. If the engine exerts a force of 40000 N and the track offers a frictional force of 5000 N, then calculate : [ 3 ]

(a) The net accelerating force (b) The acceleration of the train (c) The force of wagon 1 on 2.