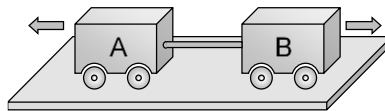


## PHYSICS: FRICTION

### DPP No. : 2

1. Two carts of masses 200 kg and 300 kg on horizontal rails are pushed apart. Suppose the coefficient of friction between the carts and the rails are same. If the 200 kg cart travels a distance of 36 m and stops, then the distance travelled by the cart weighing 300 kg is



- (1) 32 m                      (2) 24 m                      (3) 16 m                      (4) 2 m
2. A body of 10 kg is acted by a force of 129.4 N if  $g = 9.8 \text{ m/sec}^2$ . The acceleration of the block is  $10 \text{ m/s}^2$ . What is the coefficient of kinetic friction
- (1) 0.03                      (2) 0.01                      (3) 0.30                      (4) 0.25
3. If  $\mu_s, \mu_k$  and  $\mu_r$  are coefficients of static friction, sliding friction and rolling friction, then
- (1)  $\mu_s < \mu_k < \mu_r$                       (2)  $\mu_k < \mu_r < \mu_s$                       (3)  $\mu_r < \mu_k < \mu_s$                       (4)  $\mu_r = \mu_k = \mu_s$
4. A fireman of mass 60 kg slides down a pole. He is pressing the pole with a force of 600 N. The coefficient of friction between the hands and the pole is 0.5, with what acceleration will the fireman slide down ( $g = 10 \text{ m/s}^2$ )
- (1)  $1 \text{ m/s}^2$                       (2)  $2.5 \text{ m/s}^2$                       (3)  $10 \text{ m/s}^2$                       (4)  $5 \text{ m/s}^2$
5. A given object takes  $n$  times as much time to slide down a  $45^\circ$  rough incline as it takes to slide down a perfectly smooth  $45^\circ$  incline. The coefficient of kinetic friction between the object and the incline is given by
- (1)  $\left(1 - \frac{1}{n^2}\right)$                       (2)  $\frac{1}{1-n^2}$                       (3)  $\sqrt{\left(1 - \frac{1}{n^2}\right)}$                       (4)  $\sqrt{\frac{1}{1-n^2}}$
6. The coefficient of friction between a body and the surface of an inclined plane at  $45^\circ$  is 0.5. If  $g = 9.8 \text{ m/s}^2$ , the acceleration of the body downwards in  $\text{m/s}^2$  is
- (1)  $\frac{4.9}{\sqrt{2}}$                       (2)  $4.9\sqrt{2}$                       (3)  $19.6\sqrt{2}$                       (4) 4.9

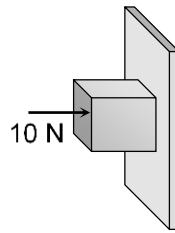
7. A body of mass 100 g is sliding from an inclined plane of inclination  $30^\circ$ . What is the frictional force experienced if  $\mu = 1.7$

(1)  $1.7 \times \sqrt{2} \times \frac{1}{\sqrt{3}} \text{ N}$       (2)  $1.7 \times \sqrt{3} \times \frac{1}{2} \text{ N}$       (3)  $1.7 \times \sqrt{3} \text{ N}$       (4)  $1.7 \times \sqrt{2} \times \frac{1}{3} \text{ N}$

8. A uniform chain of length  $L$  changes partly from a table which is kept in equilibrium by friction. The maximum length that can withstand without slipping is  $l$ , then coefficient of friction between the table and the chain is

(1)  $\frac{l}{L}$       (2)  $\frac{l}{L+1}$       (3)  $\frac{l}{L-1}$       (4)  $\frac{L}{L+1}$

9. A horizontal force of 10 N is necessary to just hold a block stationary against a wall. The coefficient of friction between the block and the wall is 0.2. the weight of the block is



(1) 2 N      (2) 20 N      (3) 50 N      (4) 100 N

10. A block of mass 50 kg can slide on a rough horizontal surface. The coefficient of friction between the block and the surface is 0.6. The least force of pull acting at an angle of  $30^\circ$  to the upward drawn vertical which causes the block to just slide is

(1) 29.43 N      (2) 219.6 N      (3) 21.96 N      (4) 294.3 N

11. Which one of the following statements is correct

- (1) Rolling friction is greater than sliding friction  
 (2) Rolling friction is less than sliding friction  
 (3) Rolling friction is equal to sliding friction  
 (4) Rolling friction and sliding friction are same