



Video Solution on Website:-

<https://physicsaholics.com/home/courseDetails/37>

Video Solution on YouTube:-

<https://youtu.be/3wRw25-cVK8>

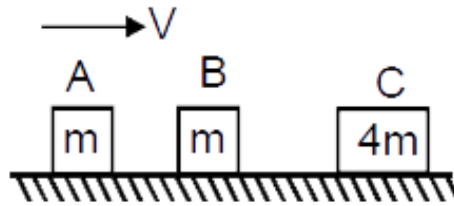
Written Solution on Website:-

<https://physicsaholics.com/note/notesDetails/49>

- Q 1. The coefficient of restitution e for a perfectly elastic collision is
(a) 0 (b) 1
(c) -1 (d) ∞
- Q 2. An object A collides head-on elastically with a stationary object B. The object B will recoil with maximum speed if ($e=1$)
(a) $M_B \gg M_A$ (b) $M_B \ll M_A$
(c) $M_B = M_A$ (d) Insufficient data to predict
- Q 3. An object A of mass m with initial velocity u collides with a stationary object B after elastic collision A moves with $\frac{u}{4}$ calculate mass of B
(a) $\frac{7m}{5}$ (b) $\frac{3m}{5}$
(c) $\frac{9m}{5}$ (d) $\frac{4m}{5}$
- Q 4. An object A of mass m moving with speed u collides one dimensionally with another stationary identical object B. Find the velocity of A after collision, if coefficient of restitution of collision is e
(a) $\left[\frac{1-e}{2}\right]u$ (b) $\left[\frac{1+e}{2}\right]u$
(c) eu (d) $-eu$
- Q 5. A ball of mass m moving with a speed $2v_0$ collides head-on with an identical ball at rest. If e is the coefficient of restitution, then what will be the ratio of velocity of two balls after collision?
(a) $\frac{1-e}{1+e}$ (b) $\frac{1+e}{1-e}$
(c) $\frac{e-1}{e+1}$ (d) $\frac{e+1}{e-1}$
- Q 6. A ball of mass m moving at a speed v makes a head-on collision with an identical ball at rest. The kinetic energy of the balls after the collision is three fourths of the original. Find the coefficient of restitution
(a) 1 (b) $\sqrt{2}$
(c) $\frac{1}{2}$ (d) $\frac{1}{\sqrt{2}}$
- Q 7. Three blocks are initially placed as shown in the figure. block A has mass m and initial velocity v to the right. Block B with mass m and block C with mass $4m$ are



both initially at rest. Neglect friction. All collisions are elastic. The final velocity of block A is :



- (a) $0.6v$ to the left
- (b) $1.4v$ to the left
- (c) v to the left
- (d) $0.4v$ to the left

- Q 8. A block of mass 5 kg moves from left to right with a velocity of 2m/s and collides with another block of mass 3 kg moving along the same line in the opposite direction with velocity 4m/s. If coefficient of restitution is 0.6, determine velocity of the 5 kg block after their collision
- (a) 0.6 m/s towards right
 - (b) 1.6 m/s towards left
 - (c) 1.6 m/s towards right
 - (d) 0.6 towards left
- Q 9. Two bodies of masses 5 kg and 3 kg moving in the same direction along the same straight line with velocities 5m/s and 3m/s respectively suffer one-dimensional elastic collision . Find their velocities after the collision
- (a) -3.5 m/s, 5.5 m/s
 - (b) 5.5 m/s, 3.5 m/s
 - (c) 3.5 m/s, 5.5 m/s
 - (d) 2.5 m/s, 4.5 m/s
- Q 10. A 10 kg ball and 20 kg ball approach each other with velocities 20m/s and $-10m/s$ respectively . What are their velocities after collision if the collision is perfectly elastic ?
- (a) 10 m/s, 20 m/s
 - (b) -10 m/s, 20 m/s
 - (c) 15 m/s, 25 m/s
 - (d) -20 m/s, 10 m/s
- Q 11. In an inelastic collision, which of the following is incorrect
- (a) the velocity of both the particles may be same after the collision
 - (b) kinetic energy is not conserved
 - (c) linear momentum of the system is conserved
 - (d) velocity of separation after collision will be more than velocity of approach before collision
- Q 12. Two particles of masses 0.5 kg and 0.25kg moving with velocity 4.0 m/s and $-3.0m/s$ collide head on in a perfectly inelastic collision. Find the velocity of the composite particle after collision and KE lost in the collision
- (a) 1.67 m/s, 4.1 J
 - (b) 4.1 m/s, 1.67 J
 - (c) 1.25 m/s, 4.8 J
 - (d) 1.27 m/s, 3.2 J
- Q 13. Two equal lumps of putty are suspended side by side from two long strings so that they are just touching. One is drawn aside so that its center of gravity rises a vertical distance

h. It is released and then collides inelastically with the other one. The vertical distance risen by the center of gravity of the combination is -

- (a) h (b) $3h/4$
 (c) $h/2$ (d) $h/4$

Q 14. As shown in figure A, B and C are identical balls B and C are at rest and, the ball A moving with velocity v collides elastically with ball B, then after collision:



- (a) All the three balls move with velocity $v/2$
 (b) A comes to rest and (B + C) moves with velocity $v/\sqrt{2}$
 (c) A moves with velocity v and (B + C) moves with velocity v
 (d) A and B come to rest and C moves with velocity v

Answer Key

Q.1 b	Q.2 b	Q.3 b	Q.4 a	Q.5 a
Q.6 d	Q.7 a	Q.8 b	Q.9 c	Q.10 d
Q.11 d	Q.12 a	Q.13 d	Q.14 d	