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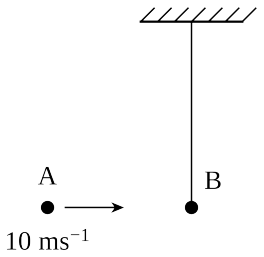
NEET WORK, ENERGY AND POWER — COLLISIONS IN ONE DIMENSION (ELASTIC AND INELASTIC) — PYQS

Max. Marks: 28 **Questions:** 7

Section A (MCQ) — 7 questions

Q.1 Bob B of mass m at rest is hanging vertically from the ceiling via a massless string of length 10 m, as shown in the figure. Point mass A of mass m travelling horizontally with speed 10 ms^{-1} hits bob B elastically. The bob B rises h meter after the collision. Taking the acceleration due to gravity g = 10 ms^{-2} and neglecting the size of the bob, the value of h is: [RE-NEET (UG) 2026]



(1) 2.5 (2) 8 (3) 7 (4) 5

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Q.2 Two bodies A and B of same mass undergo completely inelastic one dimensional collision. The body A moves with velocity v_1 while body B is at rest before collision. The velocity of the system after collision is v_2. The ratio $v_1:v_2$ is [NEET (UG) 2024]

(1) 1:2 (2) 2:1 (3) 4:1 (4) 1:4

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Q.3 Body A of mass 4m moving with speed u collides with another body B of mass 2 m, at rest. The collision is head on and elastic in nature. After the collision the fraction of energy lost by the colliding body A is : [NEET (UG) 2019]

(1) $\frac{5}{9}$ (2) $\frac{4}{9}$ (3) $\frac{8}{9}$ (4) $\frac{1}{9}$

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Q.4 A moving block having mass m, collides with another stationary block having mass 4m. The lighter block comes to rest after collision. When the initial velocity of the lighter block is v, then the value of coefficient of restitution (e) will be [NEET 2018]

(1) 0.5 (2) 0.25 (3) 0.8 (4) 0.4

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Q.5 Two identical balls A and B having velocities of 0.5 m s^{-1} and −0.3 m s^{-1} respectively collide elastically in one dimension. The velocities of B and A after the collision respectively will be : [NEET 2016 (Phase 2)]

(1) −0.5 m s^{-1} and 0.3 m s^{-1}
(2) 0.5 m s^{-1} and −0.3 m s^{-1}
(3) −0.3 m s^{-1} and 0.5 m s^{-1}
(4) 0.3 m s^{-1} and 0.5 m s^{-1}

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Q.6 Two particles of masses m_1, m_2 move with initial velocities u_1 and u_2. On collision, one of the particles gets excited to higher level, after absorbing energy ε. If final velocities of particles be v_1 and v_2 then we must have : [AIPMT 2015 (Cancelled)]

(1) $\frac{1}{2}m_1u_1^2+\frac{1}{2}m_2u_2^2-\varepsilon=\frac{1}{2}m_1v_1^2+\frac{1}{2}m_2v_2^2$
(2) $\frac{1}{2}m_1^2u_1^2+\frac{1}{2}m_2^2u_2^2+\varepsilon=\frac{1}{2}m_1^2v_1^2+\frac{1}{2}m_2^2v_2^2$
(3) $m_1^2u_1 + m_2^2u_2 - \varepsilon = m_1^2v_1 + m_2^2v_2$
(4) $\frac{1}{2}m_1u_1^2+\frac{1}{2}m_2u_2^2=\frac{1}{2}m_1v_1^2+\frac{1}{2}m_2v_2^2-\varepsilon$

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Q.7 A ball moving with velocity 2 m/s collides head on with another stationary ball of double the mass. If the coefficient of restitution is 0.5, then their velocities (in m/s) after collision will be [AIPMT 2010 (Prelims)]

(1) 0, 1 (2) 1, 1 (3) 1, 0.5 (4) 0, 2

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ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	**4**	**2**	**3**	**2**	**2**	**1**	**1**				