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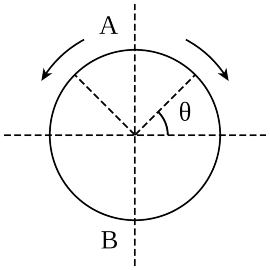
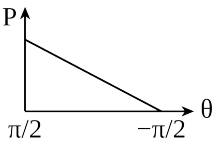
NEET LAWS OF MOTION — CONSERVATION OF LINEAR MOMENTUM — PYQS

Max. Marks: 52 **Questions:** 13

Section A (MCQ) — 13 questions

Q.1 A frictionless circular wire of unit radius is fixed on the horizontal plane. Two-point particles of unit mass start moving simultaneously from point $A\left(\theta=\frac{\pi}{2}\right)$ with identical uniform angular speeds in opposite directions, and meet again at point $B\left(\theta=-\frac{\pi}{2}\right)$. During this time, which of the following figures schematically represent the magnitude of the total linear momentum P of the system, as a function of θ? [RE-NEET (UG) 2026]



(1)


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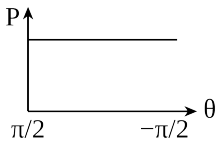

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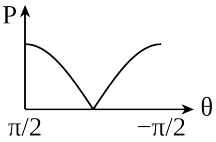

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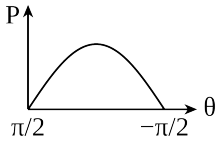

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Q.2 A shell of mass m is at rest initially. It explodes into three fragments having mass in the ratio 2:2:1. If the fragments having equal mass fly off along mutually perpendicular directions with speed v, the speed of the third (lighter) fragment is : [NEET (UG) 2022]

(1) v (2) $\sqrt{2}$v (3) $2\sqrt{2}$v (4) $3\sqrt{2}$v

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Q.3 A bullet of mass 10 g moving horizontally with a velocity of 400 m s^{-1} strikes a wood block of mass 2 kg which is suspended by light inextensible string of length 5 m. As a result, the centre of gravity of the block is found to rise a vertical distance of 10 cm. The speed of the bullet after it emerges out horizontally from the block will be [NEET 2016 (Phase 2)]

(1) 100 m s^{-1} (2) 80 m s^{-1}
(3) 120 m s^{-1} (4) 160 m s^{-1}

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Q.4 A body of mass (4m) is lying in x-y plane at rest. It suddenly explodes into three pieces. Two pieces, each of mass (m) move perpendicular to each other with equal speeds (v). The total kinetic energy generated due to explosion is : [AIPMT 2014]

(1) mv^2 (2) $\frac{3}{2}mv^2$ (3) $2mv^2$ (4) $4mv^2$

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Q.5 An explosion breaks a rock into three parts in a horizontal plane. Two of them go off at right angles to each other. The first part of mass 1 kg moves with a speed of 12 m s^{-1} and the second part of mass 2 kg moves with 8 m s^{-1} speed. If the third part flies off with 4 m s^{-1} speed, then its mass is : [NEET 2013]

(1) 7 kg (2) 17 kg (3) 3 kg (4) 5 kg

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Q.6 A person holding a rifle (mass of person and rifle together is 100 kg) stands on a smooth surface and fires 10 shots horizontally, in 5 s. Each bullet has a mass of 10 g with a muzzle velocity of 800 m s^{-1}. The final velocity acquired by the person and the average force exerted on the person are : [NEET 2013 (Karnataka)]

(1) −0.08 m s^{-1}, 16 N (2) −0.8 m s^{-1}, 16 N
(3) −1.6 m s^{-1}, 16 N (4) −1.6 m s^{-1}, 8 N

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Q.7 A man of 50 kg mass is standing in a gravity free space at a height of 10 m above the floor. He throws a stone of 0.5 kg mass downwards with a speed 2 m/s. When the stone reaches the floor, the distance of the man above the floor will be [AIPMT 2010 (Prelims)]

(1) 9.9 m (2) 10.1 m (3) 10 m (4) 20 m

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Q.8 An explosion blows a rock into three parts. Two parts go off at right angles to each other. These two are, 1 kg first part moving with a velocity of 12 m s^{-1} and 2 kg second part moving with a velocity 8 m s^{-1}. If the third part flies off with a velocity of 4 m s^{-1}, its mass would be: [AIPMT 2009]

(1) 7 kg (2) 17 kg (3) 3 kg (4) 5 kg

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Q.9 A shell of mass 200 gm is ejected from a gun of mass 4 kg by an explosion that generates 1.05 kJ of energy. The initial velocity of the shell is : [AIPMT 2008]

(1) 40 m s^{-1} (2) 120 m s^{-1}

(3) 100 m s^{-1} (4) 80 m s^{-1}

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Q.10 A bomb of mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 m s^{-1}. The kinetic energy of the other mass is : [AIPMT 2005]

(1) 324 J (2) 486 J (3) 256 J (4) 524 J

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Q.11 A stationary particle explodes into two particles of masses m_1 and m_2 which move in opposite directions with velocities v_1 and v_2. The ratio of their kinetic energies E_1/E_2 is : [AIPMT 2003]

(1) m_2/m_1 (2) m_1/m_2

(3) 1 (4) m_1v_2/m_2v_1

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Q.12 A 1 kg stationary bomb is exploded in three parts having mass 1:1:3 respectively. The parts having the same mass move in perpendicular directions with velocity 30 m/s, then the velocity of the bigger part will be [AIPMT 2001]

(1) $10\sqrt{2}$ m/s (2) $\frac{10}{\sqrt{2}}$ m/s

(3) $15\sqrt{2}$ m/s (4) $\frac{15}{\sqrt{2}}$ m/s

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Q.13 A mass of 1 kg is thrown up with a velocity of 100 m/s. After 5 seconds, it explodes into two parts. One part of mass 400 g comes down with a velocity 25 m/s. The velocity of other part is (Take g = 10 m s^{-2}) [AIPMT 2000]

(1) 40 m/s (2) 50 m/s (3) 100 m/s (4) 60 m/s

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**4**	**3**	**3**	**2**	**4**	**2**	**2**	**4**	**3**	**2**	**1**
Ques.	12	13									
Ans.	**1**	**3**									