

PYQSide

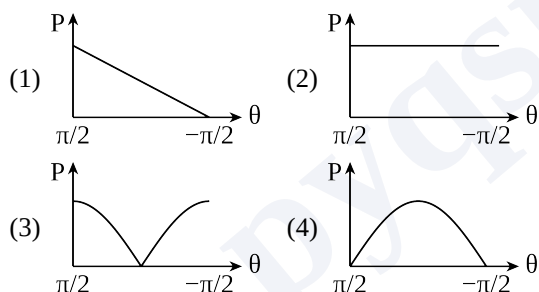
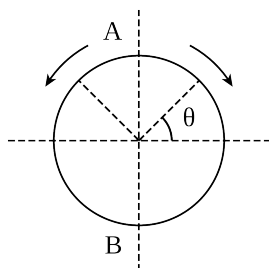
NEET LAWS OF MOTION — CONSERVATION OF LINEAR MOMENTUM — PYQS

Max. Marks: 52

Questions: 13

Section A (MCQ)

- 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 $A(\theta = \frac{\pi}{2})$ with identical uniform angular speeds in opposite directions, and meet again at point $B(\theta = -\frac{\pi}{2})$. 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]



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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) $m_1 v_2 / m_2 v_1$

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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) $10\sqrt{2} \text{ m/s}$

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

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

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

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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 $g = 10 \text{ m s}^{-2}$)

[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									