

PYQSide

NEET MOTION IN A PLANE — PROJECTILE MOTION — PYQS

Max. Marks: 64

Questions: 16

Section A (MCQ)

- Q.1** A bullet is fired from a gun at the speed of 280 m s^{-1} in the direction 30° above the horizontal. The maximum height attained by the bullet is

($g = 9.8 \text{ m s}^{-2}$, $\sin 30^\circ = 0.5$) :- [NEET (UG) 2023]

- (1) 2000 m (2) 1000 m (3) 3000 m (4) 2800 m

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- Q.2** A ball is projected with a velocity, 10 m s^{-1} , at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be

[NEET (UG) 2022]

- (1) Zero (2) $5\sqrt{3} \text{ m s}^{-1}$
(3) 5 m s^{-1} (4) 10 m s^{-1}

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- Q.3** A cricket ball is thrown by a player at a speed of 20 m/s in a direction 30° above the horizontal. The maximum height attained by the ball during its motion is

($g = 10 \text{ m/s}^2$) [NEET (UG) 2022 (Phase 2)]

- (1) 25 m (2) 5 m (3) 10 m (4) 20 m

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- Q.4** A particle moving in a circle of radius R with a uniform speed takes a time T to complete one revolution.

If this particle were projected with the same speed at an angle ' θ ' to the horizontal, the maximum height attained by it equals $4R$. The angle of projection, θ , is then given by : [NEET (UG) 2021]

(1) $\theta = \sin^{-1} \left(\frac{2gT^2}{\pi^2 R} \right)^{1/2}$

(2) $\theta = \cos^{-1} \left(\frac{gT^2}{\pi^2 R} \right)^{1/2}$

(3) $\theta = \cos^{-1} \left(\frac{\pi^2 R}{gT^2} \right)^{1/2}$

(4) $\theta = \sin^{-1} \left(\frac{\pi^2 R}{gT^2} \right)^{1/2}$

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- Q.5** A car starts from rest and accelerates at 5 m/s^2 . At $t = 4 \text{ s}$, a ball is dropped out of a window by a person sitting in the car. What is the velocity and acceleration of the ball at $t = 6 \text{ s}$? (Take $g = 10 \text{ m/s}^2$)

[NEET (UG) 2021]

- (1) $20\sqrt{2} \text{ m/s}$, 10 m/s^2
(2) 20 m/s , 5 m/s^2
(3) 20 m/s , 0
(4) $20\sqrt{2} \text{ m/s}$, 0

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- Q.6** A projectile is fired from the surface of the earth with a velocity of 5 m s^{-1} and angle θ with the horizontal. Another projectile fired from another planet with a velocity of 3 m s^{-1} at the same angle follows a trajectory which is identical with the trajectory of the projectile fired from the earth. The value of the acceleration due to gravity on the planet (in m s^{-2}) is

(Given $g = 9.8 \text{ m s}^{-2}$) [AIPMT 2014]

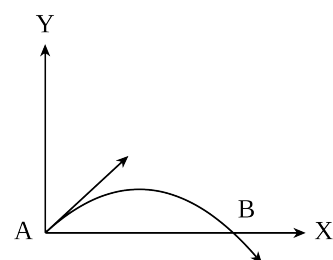
- (1) 3.5 (2) 5.9 (3) 16.3 (4) 110.8

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- Q.7** The velocity of a projectile at the initial point A is $(2\hat{i} + 3\hat{j}) \text{ m/s}$. Its velocity (in m/s) at point B is

[NEET 2013]



- (1) $2\hat{i} - 3\hat{j}$ (2) $2\hat{i} + 3\hat{j}$ (3) $-2\hat{i} - 3\hat{j}$ (4) $-2\hat{i} + 3\hat{j}$

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- Q.8** The horizontal range and the maximum height of a projectile are equal. The angle of projection of the projectile is

[AIPMT 2012 (Prelims)]

- (1) $\theta = \tan^{-1}\left(\frac{1}{4}\right)$ (2) $\theta = \tan^{-1}(4)$
 (3) $\theta = \tan^{-1}(2)$ (4) $\theta = 45^\circ$

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Q.9 A projectile is fired at an angle of 45° with the horizontal. Elevation angle of the projectile at its highest point as seen from the point of projection, is

[AIPMT 2011 (Mains)]

- (1) 45° (2) 60°
 (3) $\tan^{-1}\left(\frac{1}{2}\right)$ (4) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

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Q.10 A missile is fired for maximum range with an initial velocity of 20 m/s. If $g = 10 \text{ m/s}^2$, the range of the missile is

[AIPMT 2011 (Prelims)]

- (1) 40 m (2) 50 m (3) 60 m (4) 20 m

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Q.11 The speed of a projectile at its maximum height is half of its initial speed. The angle of projection is

[AIPMT 2010 (Mains)]

- (1) 60° (2) 15° (3) 30° (4) 45°

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Q.12 A particle of mass m is projected with velocity v making an angle of 45° with the horizontal. When the particle lands on the level ground the magnitude of the change in its momentum will be :

[AIPMT 2008]

- (1) $mv\sqrt{2}$ (2) zero (3) $2mv$ (4) $mv/\sqrt{2}$

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Q.13 For angles of projection of a projectile at angle $(45^\circ - \theta)$ and $(45^\circ + \theta)$, the horizontal range described by the projectile are in the ratio of

[AIPMT 2006]

- (1) 2 : 1 (2) 1 : 1 (3) 2 : 3 (4) 1 : 2.

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Q.14 A particle A is dropped from a height and another particle B is projected in horizontal direction with speed of 5 m/sec from the same height then correct statement is

[AIPMT 2002]

- (1) particle A will reach at ground first with respect to particle B
 (2) particle B will reach at ground first with respect to particle A
 (3) both particles will reach at ground simultaneously
 (4) both particles will reach at ground with same speed.

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Q.15 A particle is projected making an angle of 45° with horizontal having kinetic energy K . The kinetic energy at highest point will be

[AIPMT 2001]

- (1) $\frac{K}{\sqrt{2}}$ (2) $\frac{K}{2}$ (3) $2K$ (4) K

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Q.16 Two projectiles of same mass and with same velocity are thrown at an angle 60° and 30° with the horizontal, then which will remain same

[AIPMT 2000]

- (1) time of flight
 (2) range of projectile
 (3) maximum height acquired
 (4) all of them

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	2	2	1	1	1	1	2	3	1	1
Ques.	12	13	14	15	16						
Ans.	1	2	3	2	2						