Yakeen NEET 2.0 2026

Motion in a Plane

Assignment-02
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1. A bullet is fired from a gun at the speed of 280 m/s in the direction 30° above the horizontal. The maximum height attained by the bullet is
($g = 9.8\ ms^{-2}$, $\sin 30° = 0.5$) **[NEET 2023]**

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

2. A ball is projected with a velocity, 10 ms^{-1}, at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be:
[NEET 2022]

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

3. 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 2021]

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

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

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

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

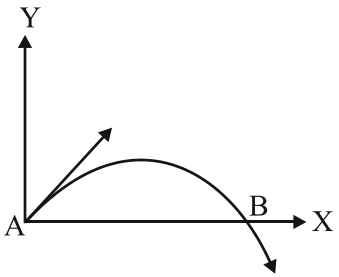
4. A car starts from rest and accelerates at 5 m/s^2. At $t = 4s$, a ball is dropped out of a window by a person sitting in the car. What is the velocity and acceleration of the ball at $t = 6s$? **[NEET 2021]**

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

5. A projectile is fired from the surface of the earth with a velocity of 5 ms^{-1} and angle θ with the horizontal. Another projectile fired from another planet with a velocity of 3 ms^{-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 is (in ms^{-2}) is: (given $g = 9.8\ ms^{-2}$)
[NEET 2014]

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

6. The velocity of a projectile at the initial point A $(2\hat{i} + 3\hat{j})$ 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) $2\hat{i} - 3\hat{j}$

7. The horizontal range and the maximum height of a projectile are equal. The angle of projection of the projectile is: **[2012 Pre]**

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

8. A missile is fired for maximum range with an initial velocity of 20 m/s. If g = 10 m/s^2, the range of the missile is: **[2011 Pre]**

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

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:
[2011 Mains]

(1) 60° (2) $\tan^{-1}\frac{1}{2}$

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

10. The speed of a projectile at its maximum height is half of its initial speed. The angle of projection is:
[2010 Mains]

(1) 60° (2) 15°
(3) 30° (4) 45°

11. 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
[NEET 2008]

(1) $\sqrt{2}mv$ (2) Zero

(3) $2\ mv$ (4) $\frac{mv}{\sqrt{2}}$

12. For angles of projection of a projectile at angles $(45° - \theta)$ and $(45° + \theta)$, the horizontal ranges described by the projectile are in the ratio of:
[NEET 2006]

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

13. Particle (A) is dropped from a height and another particle (B) is projected in horizontal direction with speed of 5 m/s from the same height, then correct statement is: **[NEET 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.

14. A particle is projected making angle 45° with horizontal having kinetic energy K. The kinetic energy at highest point will be: **[NEET 2001]**

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

15. Two projectiles of same mass and with same velocity are thrown at an angle 60° and 30° with the horizontal, then which quantity will remain same:
[NEET 2000]

(1) Time of flight
(2) Horizontal range of projectile
(3) Max height acquired
(4) All of them

16. Two particles are projected with same initial velocity one makes angle θ with horizontal while other makes an angle θ with vertical. If their common range is R then product of their time of flight is direction proportional to: **[NEET 1999]**

(1) R (2) R^2
(3) $1/R$ (4) R^0

17. If a body A of mass M is thrown with velocity v at an angle of 30° to the horizontal and another body B of the same mass is thrown with the same speed at an angle of 60° to the horizontal, the ratio of horizontal range of A to B will be: **[NEET 1992, 90]**

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

18. The maximum range of a gun of horizontal terrain is 16 km. If $g = 10\ ms^{-2}$, then muzzle velocity of a shell must be: **[NEET 1990]**

(1) $160\ ms^{-1}$ (2) $200\sqrt{2}\ ms^{-1}$
(3) $400\ ms^{-1}$ (4) $800\ ms^{-1}$

ANSWER KEY

1.	(4)	10.	(1)
2.	(3)	11.	(1)
3.	(3)	12.	(1)
4.	(3)	13.	(3)
5.	(1)	14.	(2)
6.	(4)	15.	(2)
7.	(2)	16.	(1)
8.	(1)	17.	(2)
9.	(2)	18.	(3)

PW Web/App - https://smart.link/7wwosivoicgd4

Library- https://smart.link/sdfez8ejd80if