

CLASS 11

PHYSICS

EXTRA QUESTIONS

Class 11 Physics Chapter 3 Motion in a Plane – Extra Questions with Answers

Extra practice questions for Class 11 Physics Chapter 3 (Motion in a Plane), beyond the textbook. These Class 11 Physics Chapter 3 important questions are handy for last-minute exam practice.

Contents

Very Short Answer Questions (1 mark)

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Class 11 Physics Chapter 3 – Solutions and Notes

Extra practice questions for Class 11 Physics Chapter 3 (Motion in a Plane), beyond the textbook. These Class 11 Physics Chapter 3 important questions are handy for last-minute exam practice.

Very Short Answer Questions (1 mark)

Q1. Give an example of a vector quantity.

Ans: Displacement (or velocity, force, acceleration).

Q2. What is the formula for centripetal acceleration?

Ans: $a_c = v^2/r$.

Q3. At what angle of projection is the range of a projectile maximum?

Ans: 45° .

Q4. What is the shape of the path followed by a projectile?

Ans: A parabola.

Q5. Define angular velocity.

Ans: The rate of change of angular displacement, $\omega = v/r$, measured in rad/s.

Short Answer Questions (2–3 marks)

Q6. A vector has magnitude 10 units at 30° to the x-axis. Find its rectangular components.

Ans: $A_x = 10\cos 30^\circ = 8.66$ units, $A_y = 10\sin 30^\circ = 5$ units.

Q7. A ball is projected with speed 20 m/s at 30° above the horizontal. Find its time of flight ($g=10$ m/s²).

Ans: $T = 2u \sin\theta/g = 2(20)\sin 30^\circ/10 = 2(20)(0.5)/10 = 2$ s.

Q8. A stone tied to a 1 m string moves in a circle at 2 m/s. Find its centripetal acceleration.

Ans: $a_c = v^2/r = 4/1 = 4$ m/s².

Higher-Order Thinking / Application Questions

Q9. A projectile is launched at 40 m/s at an angle of 30° with the horizontal ($g=10$ m/s²). Calculate the maximum height, time of flight, and horizontal range, and explain why the range would be the same for a launch angle of 60° .

Ans: $H = u^2 \sin^2\theta/2g = 1600(0.25)/20 = 20$ m. $T = 2u \sin\theta/g = 2(40)(0.5)/10 = 4$ s. $R = u^2 \sin 2\theta/g = 1600 \sin 60^\circ/10 = 1600(0.866)/10 = 138.6$ m. The range is the same for 30° and 60° because $\sin 2\theta$ is the same for complementary angles ($\sin 60^\circ = \sin 120^\circ$), so R depends on $\sin 2\theta$ which is identical for θ and $(90^\circ - \theta)$.

Q10. Explain why an object in uniform circular motion is accelerating even though its speed is constant, and describe the direction of this acceleration at any instant.

Ans: Acceleration is the rate of change of velocity, which is a vector. Even if the magnitude (speed) of velocity is constant, its direction is continuously changing as the object moves along the circle, so the velocity vector itself is changing, meaning there is a nonzero acceleration. This acceleration, called centripetal acceleration, is directed radially inward, toward the centre of the circular path, at every instant.

Class 11 Physics Chapter 3 – Solutions and Notes

For complete step-by-step answers and a quick summary, check the [Class 11 Physics Chapter 3 Solutions](#) and [Class 11 Physics Chapter 3 Revision Notes](#).

See also: [Chapter 1](#) | [Chapter 2](#) | [Chapter 3](#)

Practice more: [Chapter 1](#) | [Chapter 2](#)

Quick revision: [Chapter 1](#) | [Chapter 2](#)

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