NIOS/Acad./2020/312/04/E

National Institute of Open Schooling
Senior Secondary
Lesson 4 – Motion in a Plane
Worksheet-4

Q1. Observe your surroundings and give examples of Projectile Motion from day to day life.

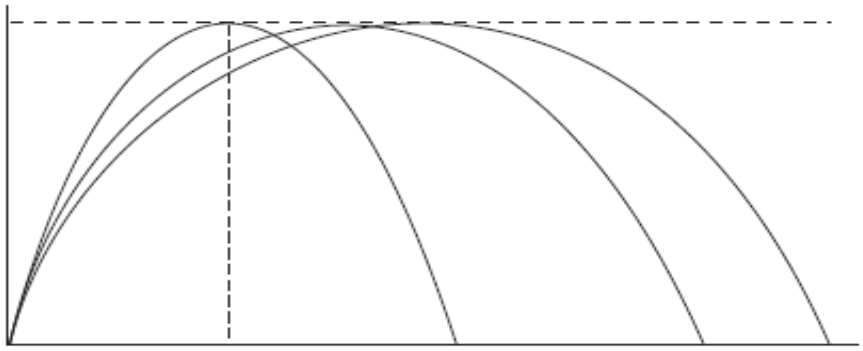
Q2. Take two balls and project one of them horizontally from the top of the building. At the same time drop the other ball downward from the same height. Observe the path of both balls and time to hit the ground. Is it same? Explain with reasons.

Q3. Take a ball and project the ball horizontally from the top of the building. Observe the projectile motion of ball and explain with reason which two quantities are constant throughout projectile motion when air resistance is negligible?

Q4. Suppose you want to launch a projectile to land at a certain target, for instance, a cricket ball beyond the boundary. What are the important factors you have to calculate before launching the projectile? Analyze projectile motion to determine all these factors.

Q5. Suppose you are riding a bicycle along a Circular path of the Park near the house. Measure the radius of Circular Path. Count the time to complete one round and calculate the total length of the Circular Path.

Q6. Take three stones and throw them at different angles such that they reach the same maximum height as shown in the given figure.



Observe the trajectories of all three projectiles and calculate for all three stones

a) Time of Flight
b) A constant horizontal velocity component
c) A constant vertically downward acceleration component

Observe and explain are these same for all three stones.

Q7. Continue to Q.6 Derive the equation of path of projectile motion and equation of trajectory.

Q8. Observe your surroundings and give examples of Uniform Circular Motion from day to day life. Explain applications of Uniform Circular Motion in day to day life.

Q9. A truck goes around a circular track of radius R at speed v so that it makes one circuit every T seconds As it does so it experiences a centripetal acceleration of magnitude p. If the truck now goes around a different circular track of radius 4R so that it now takes a time ½T to go around once, what is the magnitude of its centripetal acceleration?

Q10. Explain in your own words what is meant by centripetal acceleration? Derive an expression for the same.