

**PHYSICS ASSIGNMENT NO. 1 Class XI**  
**KINEMATICS**

**UNIT – II**

1 Mark question :-

- Q1. What is significance of the slope of x-t graph?  
Q2. Give an example of a body possessing zero velocity and still accelerating.  
Q3. Why does earth impart same acceleration to all bodies? Q4. Is it possible to have negative value in speed & displacement?  
Q5. Why does a parachute descend slowly?  
Q6. Write the values of the following:- (i)  $\hat{j} \cdot \hat{k}$  (ii)  $\hat{j} \cdot \hat{k}$  (iii)  $\hat{j} \cdot \hat{i}$  (iv)  $\hat{i} \cdot \hat{k}$  (v)  $\hat{i} \cdot (\hat{i} \times \hat{j})$   
(vi)  $\hat{k} \cdot (\hat{i} \times \hat{k})$   
Q7. What will be effect on horizontal range of a projectile when its initial speed is doubled with its angle of projections same?  
Q8. Name the physical quantity which remains same in a uniform circular motion.  
Q9. When do we call 2 vectors orthogonal? Q10. What is the path followed by a Javelin projected horizontally by an athlete?

2 mark questions :-

- Q1. What are co-initial and collinear vectors?  
Q2. At what point of projectile path the speed is minimum (ii) at what point, the speed is maximum.  
Q3. Why are the passengers of a car rounding of curve thrown outward?  
Q4. Prove that max horizontal range is 4 times max height attained by projectile which is fired along reqd oblique direction.  
Q5. The angle between vector  $\vec{A}$  and  $\vec{B}$  is  $60^\circ$ . What is the ratio of  $\vec{A} \cdot \vec{B}$  and  $|\vec{A} \times \vec{B}|$  ?

3 mark questions :-

- Q1. What is meant by centripetal acceleration? Derive the formula for centripetal acceleration.  
Q2. From the top of a tower 100 m in height, a ball is dropped and at the same time another ball is projected vertically upwards from the ground with a velocity of  $25 \text{ ms}^{-1}$ . Find when and where the two balls will meet?  $g = 9.8 \text{ ms}^{-2}$ .  
Q3. Find an expression for the maximum speed of circular motion of a car in a circular horizontal track of radius 'R'. The coefficient of static friction between the car tyres and the road along the surfaces is  $\mu_s$ .  
Q4. The displacement (in metre) of a particle moving along x-axis is given by  $x = 18t + 5t^2$ . Calculate:-  
(i) the instantaneous velocity at  $t = 2$  seconds. (ii) average velocity between  $t = 2\text{s}$  &  $t = 3\text{s}$ . (iii) Instantaneous acceleration.  
Q5. A woman starts from her home at 8.00 a.m. walks with speed of 5 km/hr on straight road upto her office 5 km. away stays at office upto 4 p.m. & returns home by auto with speed of 25 km / hr. Choose suitable scales & plot x – t graph of her motion.  
Q6. Derive  $S = Ut + \frac{1}{2}at^2$  graphically.  
Q7. A projectile shot at an angle of  $60^\circ$  above the horizontal ground strikes a vertical wall 30 m away at a point 15 m above the ground. Find the speed with which the projectile was launched and the speed with which it strikes the wall.  
Q8. A projectile is fired at an angle  $\theta$  with the horizontal  
(a) Show that its trajectory is a parabola. (b) Obtain (i) maximum height (ii) time of its flight.