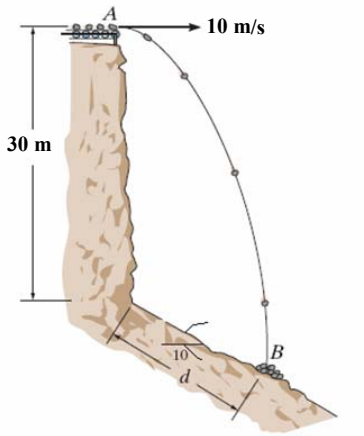
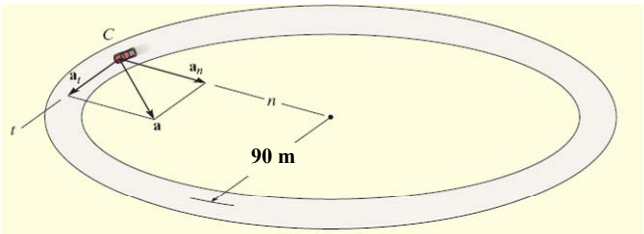
Alexandria Higher Institute of Engineering & Technology (AIET)		
General		Preparatory Year
ME002	Mechanics II	Midterm, May, 4, 2011
Examiners:	Dr. Rola Afify and committee	Time: 1.5 hours

Answer the following questions:

1- The acceleration of a particle as it moves along a straight line is given by $a = 2t - 1$, in m/s^2, where t is in seconds. If s = 1 m and v = 2 m/s when t = 0, determine the particle's velocity and position when t = 6 s. Also, determine the average velocity and average speed during this time period.

2- The stones are thrown off the conveyor with a horizontal velocity of 10 m/s as shown in figure. Determine the distance d down the slope to where the stones hit the ground at B.



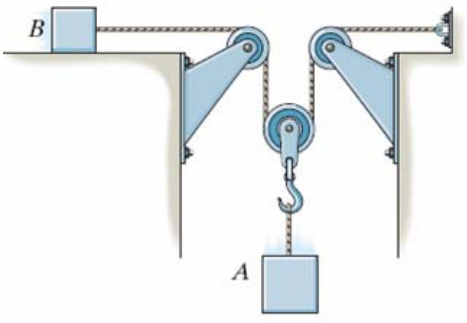


3- A car race C travels around the horizontal circular track that has a radius of 90 m as shown in figure. If the car has a speed $v = 2.1t$, determine (with respect to time):-

a) Normal and tangential components of acceleration.

b) Radial and transverse components of acceleration.

4- At a given instant, the 100N ($\approx$10kg) block A is moving downward with a speed of 2m/s. determine its speed at 2s later. Block B has a weight of 40N ($\approx$4kg), and the coefficient of kinetic friction between it and the horizontal plane is $\mu_k = 0.2$. Neglect the mass the pulleys and cord.



Good Luck