1. Two projectiles are projected with velocity v_A, v_B at angles θ_A (from horizontal) and θ_B (from vertical) as shown in the figure below, such that $v_A > v_B$ but having same horizontal component of velocity. Which of the following is **correct** ?
   (A) $T_A > T_B$ (B) $H_A > H_B$
   (C) $R_A > R_B$ (D) $R_B > R_A$

2. A man wishes to throw two darts one by one at the target at B with same speed so that they arrive at the same time. Mark the **CORRECT** statements about the two projections.
   (A) Projectile that travels along trajectory A was projected earlier
   (B) Projectile that travels along trajectory B was projected earlier.
   (C) Second dart must be projected at angle θ_A such that $\theta_A + \theta_B = 90°$
   (D) Second dart must be projected at angle $\theta_A > \theta_B$

3. Choose the **CORRECT** alternative(s) :-
   (A) if the greatest height to which a man can throw a stone is h, then the greatest horizontal distance upto which he can throw the stone is 2h
   (B) the angle of projection for a projectile motion, whose range R is n times the maximum height H, is $\tan^{-1}(4/n)$
   (C) the time of flight T and the horizontal range R of a projectile are connected by the equation $gT^2 = 2R\tan\theta$ where, θ is the angle of projection
   (D) A ball is thrown vertically up. Another ball is thrown at an angle θ with the vertical. Both of them remain in air for the same period of time. Then the ratio of heights attained by the two balls is 1 : 1

4. The co-ordinate of the particle in x-y plane are given as $x = 2 + 2t + 4t^2$ and $y = 4t + 8t^2$. The motion of the particle is
   (A) along a straight line (B) uniformly accelerated
   (C) along a parabolic path (D) nonuniformly accelerated

5. Which of the following get affected by horizontal air flow in an oblique projection?
   (A) time of flight (B) horizontal range
   (C) maximum height (D) velocity at highest point
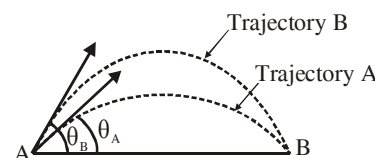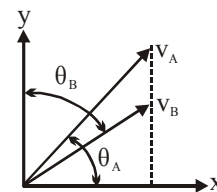
Paragarph for Question No. 6 to 8
A projectile is thrown with a velocity of 50 ms^{-1} at an angle of 53° with the horizontal

6. Choose the incorrect statement
   (A) It travels vertically with a constant velocity of 40 ms^{-1}
   (B) It travels horizontally with an initial velocity of 30 ms^{-1}
   (C) The minimum velocity of the projectile is 30 ms^{-1}
   (D) None of these

7. Determine the instants at which the projectile is at the same height
   (A) t = 1s and t = 7s (B) t = 3s and t = 5s (C) t = 2s and t = 6 s (D) all the above

8. The equation of the trajectory is given by
   (A) $180y = 240x - x^2$ (B) $180y = x^2 - 240x$ (C) $180y = 135x - x^2$ (D) $180y = x^2 - 135x$

9. A car is traveling on a straight level track with a uniform speed of 25 m/s. When the car is moving away from a gun at the same level at a distance of 1500 m the gun is fired at an angle of 45°. Find the distance of the car (kilometers) from the gun when it is hit.

10. An Indian fighter plane flying horizontally with speed 800 km/hr releases a bomb (on Pakistani bunker) at a height of 78.4 m from the ground, when will the bomb strike the ground? Give your answer in seconds. [g = 9.8 m/s^2]

N_Race # 21			ANSWER KEY
1. Ans. (A,B,C)	2. Ans. (B,C)	3. Ans. (A,B,C,D)	4. Ans. (A,B)
5. Ans. (B,D)	6. Ans. (A)	7. Ans. (D)	8. Ans. (A)
9. Ans. 2	10. Ans. 4		