# PHYSICS

**Class** **PUC 2nd Yr.**
**Class work – 01**
**Topic** **Projectile Motion (AIPMT)** **September 2015**

1. Which of the following is largest, when the height attained by the projectile is largest?
   (A) Range (B) time of flight
   (C) Angle of initial velocity with vertical (D) none

2. A ball is thrown upwards at an angle $30^0$ with the horizontal and lands at a point 20 m away and 5 m high. How fast was the ball thrown?
   (A) 10 m/s (B) 20 m/s
   (C) 40 m/s (D) 80 m/s

3. The equation of the trajectory of the projectile is $y = \sqrt{3}x - \frac{1}{2}gx^2$ where x and y are in meters. The angle of projection in degrees is
   (A) 0 (B) 90
   (C) 45 (D) 60

4. If the range of the projectile is R, its kinetic energy is maximum after a displacement of
   (A) R/4 (B) R/2
   (C) 3R/4 (D) R

5. The horizontal and vertical displacements are given by $x = 10\sqrt{3}t$ and $y = 10t - t^2$. The maximum height attained by the body is
   (A) 200 m (B) 100 m
   (C) 50 m (D) 25 m

6. Two balls A and B are thrown with speeds u and u/2 respectively. Both the balls cover the same horizontal distance before returning to the plane of projection. If the angle of projection of B is $15^0$ with the horizontal, then the angle of A is
   (A) $\sin^{-1}\frac{1}{8}$ (B) $\frac{1}{2}\sin^{-1}\frac{1}{8}$
   (C) $\frac{1}{3}\sin^{-1}\frac{1}{8}$ (D) $\frac{1}{4}\sin^{-1}\frac{1}{8}$

7. The velocity at the maximum height is half of the velocity of the projectile u. Its range on the horizontal plane is
   (A) $\frac{3u^2}{g}$ (B) $\frac{\sqrt{3}u^2}{2g}$
   (C) $\frac{3u^2}{2g}$ (D) $\frac{u^2}{3g}$

8. A large number of bullets are fired with the same speed v in all directions. The maximum area on the ground in which these bullets will spread is

(A) $\frac{\pi v^4}{g^2}$ (B) $\frac{\pi^2 v^4}{g^2}$

(C) $\frac{\pi v^2}{g}$ (D) $\frac{\pi v}{g^2}$

9. Two particles are projected with the same velocity $V_0$ at two different angles such that their horizontal range is same. The ratio of the heights attained by them is

(A) $\tan^2\theta$ (B) $V_0 \sin\theta$

(C) $\frac{V_0}{\cos\theta}$ (D) $V_0^2 \sin^2\theta$

10. A projectile can have same range R for two angles of projection. If $t_1$ and $t_2$ be the times of flight in the two cases, what is their product proportional to?

(A) R (B) $R^2$

(C) 1/R (D) $(1/R)^2$