

## High Order Thinking Skills (HOTS) Questions

**Q.1. “Component of a vector can never be more in magnitude than the vector.” Is it true?**

**Ans.** It is true. The component of a vector can never have a magnitude greater than the vector itself.

**Q.2. Is the maximum height attained by projectile is largest when its horizontal range is maximum?**

**Ans.** No, horizontal range is maximum when  $\theta = 45^\circ$  and maximum height attained by projectile is largest when  $\theta = 90^\circ$ .

**Q.3. A bomber in horizontal flight drops a bomb when it is just above the target. Explain whether the bomb hits the target or misses it? Explain.**

**Ans.** A bomber in horizontal flight drops a bomb when it is just above the target. ... This is due to the fact that at the time of dropping, the bomb possesses horizontal speed equal to the speed of bomber. So, bomb will drop and hit the ground some distance away (= horizontal speed of bomber  $\times$  time) from the place of dropping.

**Q.4. Why is earth flat at poles and bulged out at equator?**

**Ans.** Earth rotates about its own axis. Everybody on earth's surface experiences a centrifugal force. This force is maximum at the equator. Earlier when the earth was in molten state, its portion near equator experienced more centrifugal force, which moved away from the axis. As earth cooled down, it remained bulged at the equator.

**Q.5. A skilled gunman always keep his gun slightly tilted above the line of sight while shooting. Why?**

**Ans.** When a bullet is fired from a gun with its barrel directed towards the target, it starts falling downwards on account of acceleration due to gravity. Due to which the bullet hits below the target. Just to avoid it, the barrel of the gun is lined up little above the target. So that the bullet, after travelling in parabolic path hits the distant target as shown in figure below.

