There is a uniform electrostatic field in a region. The potential at various points on a small sphere centred at P , in the region, is found to vary between the limits 589.0 V to 589.8 V . What is the potential at a point on the sphere whose radius vector makes an angle of 60° with the direction of the field?

A 589.2 V

B 589.5 V

C 589.6 V

D 589.4 V

Correct option is D)

$\Delta V = E.d.$

$= Ed\cos\theta = 0.8 \times \cos 60^0$

$= 0.4$

Hence the new potential at the point on the sphere is

$589.0 + 0.4 = 589.4V$