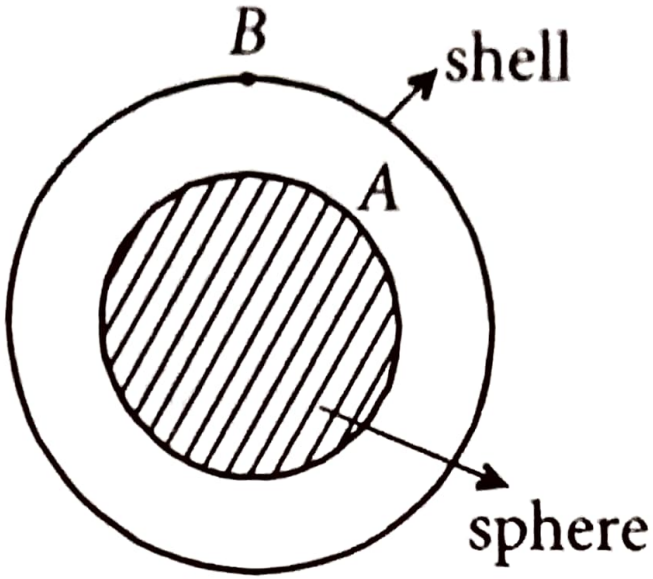
Potential inside the shell is equal to the potential on the surface of a shell.

A is a point on the surface of sphere. It is an internal point for the shell. Let *B* represent a point on the shell.

$V_A - V_B = V$

When shell is given a charge $(-3Q)$, the change of potential at A and B will be same. Let the potential due to charge $(-3Q)$ be $-V'$.



$\therefore$ New potentials at A and B are $(V_A - V')$ and $(V_B - V')$

$\therefore$ New difference $= (V_A - V') - (V_B - V')$

$= V_A - V_B$ (As before)

$\therefore$ New difference $= V$.