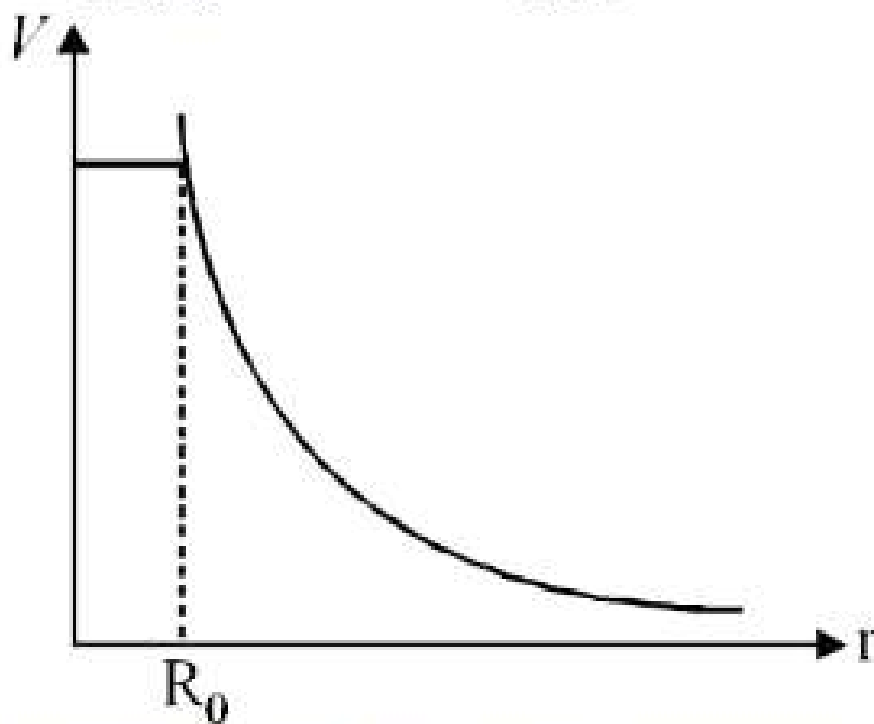A spherical symmetric charge system is centered at origin. Given, Electric potential

$$V = \frac{Q}{4\pi\varepsilon_0 R_0} (r \leq R_0), \quad V = \frac{Q}{4\pi\varepsilon_0 r} (r > R_0)$$

A. (a) Within $r = 2R_0$ total enclosed net charge is Q
B. (b) Electric field is discontinued at $r = R_0$
C. (c) Charge is only present at $r = R_0$
D. (d) Electrostatic energy is zero for $r < R_0$

Correct Answer - A::B::D

(a) The whole charge Q will be enclosed in a sphere of diameter $2R_0$. (b) Electric field E=zero inside the sphere. Hence electric field is discontinued at $r = R_0$.
(c) Changes in V and E are continuously present for $r > R_0$. Option (c) is incorrect.
(d) For $r < R_0$, the potential V is constant and the electric intensity is zero. Obviously, the electrostatic energy is zero for $r < R_0$.