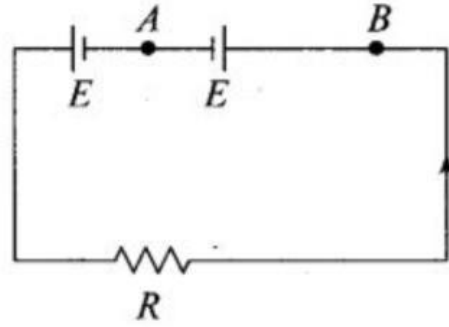**Q. 04**   Two cells of same emf E but internal resistance r_1 and r_2 are connected in series to an external resistor R (figure). What should be the value of R so that the potential difference across the terminals of the first cell becomes zero?

Solution:

In this problem first we apply Ohm's law to find current in the circuit.

Effective emf of two cells $= E + E = 2E$

Effective resistance $= R + r_1 + r_2$

So the electric current is given by

$$I = \frac{E + E}{R + r_1 + r_2}$$