Q. 06 A material 'B' has twice the specific resistance of 'A'. A circular wire made of 'B' has twice the diameter of a wire made of 'A'. then for the two wires to have the same resistance, the ratio l_B/l_A of their respective lengths must be [2006]

(a) 1

(b) $\dfrac{1}{2}$

(c) $\dfrac{1}{4}$

(d) 2

06 **(d)** $\rho_B = 2\rho_A$

$d_B = 2d_A$

$R_B = R_A \implies \dfrac{\rho_B \ell_B}{A_B} = \dfrac{\rho_A \ell_A}{A_A}$

$\therefore \dfrac{\ell_B}{\ell_A} = \dfrac{\rho_A}{\rho_B} \times \dfrac{d_B^2}{d_A^2} = \dfrac{\rho_A}{2\rho_A} \times \dfrac{4d_A^2}{d_A^2} = 2$