Conductor with two parts of different conductivities. A conductor is composed from two homogeneous pieces of the same size but of different conductivities $\sigma_1 \neq \sigma_2$. In case (a), the pieces are connected one along the other [Fig. Q3.5(a)]. In case (b), they are connected one behind the other [Fig. Q.3.5(b)]. If a time-invariant current density I is made to flow through the conductor the current density vectors in the two pieces are the same ($\mathbf{J}_1 = \mathbf{J}_2$) for

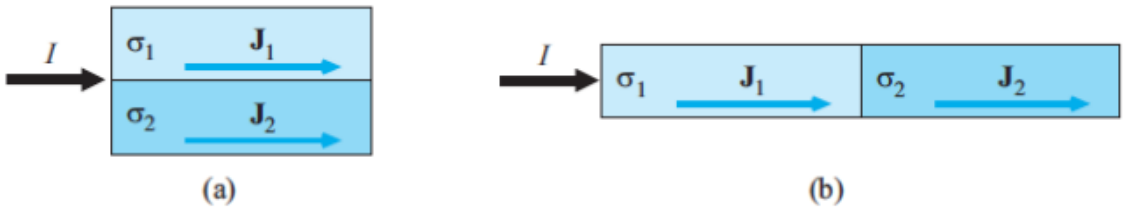

Figure Q3.5 Current conductor made of two pieces with different conductivities connected one along the other (a) and one behind the other (b); for Question 3.12.

(A) case (a) only.
(B) case (b) only.
(C) both cases.
(D) neither of these cases.
(E) depends on other material parameters.

Solution: (B)
Answer: (B)