Boundary conditions at a conductor-conductor interface. Consider a boundary surface between two conducting media of conductivities σ_1 and σ_2, where $\sigma_1 = 2\sigma_2$. Which of the cases shown in Fig. Q3.2 reprsent possible time-invariant current densities vectors on the two sides of the boundary?

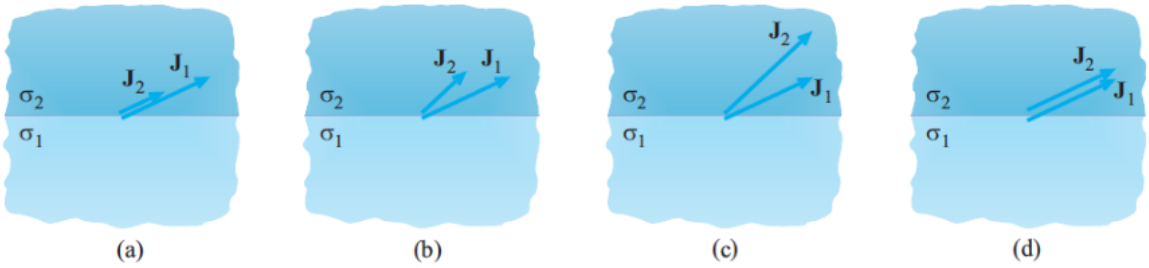

Figure Q3.2 Interface between two conducting media ($\sigma_1 = 2\sigma_2$) – four cases with different combinations (not all necessarily physically meaningful) of vectors $\mathbf{J}_1$ and $\mathbf{J}_2$ on the two sides of the boundary; for Question 3.7.

(A) Case (a) only.
(B) Case (b) only.
(C) Case (c) only.
(D) Case (d) only.
(E) More than one case.
(F) None of the cases.

Solution: (B)
Answer: (B)