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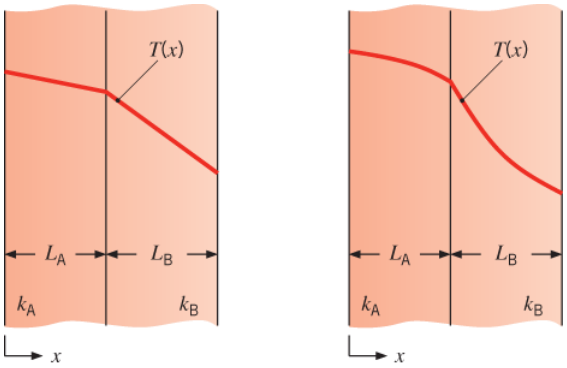
Quiz 2 - Solution

Consider the steady-state temperature distributions within a composite wall composed of Material A and Material B for the two cases shown. There is no internal generation, and the conduction process is one-dimensional.



Case 1. Linear temperature distributions exist in both materials, as shown.
Case 2. Nonlinear temperature distributions exist in both materials, as shown.

Underline the correct answer to the following question:

1) In case 1: **a)** $k_A > k_B$ **b)** $k_A = k_B$ **c)** $k_A < k_B$

2) In case 2: **a)** $k_A > k_B$ **b)** $k_A = k_B$ **c)** $k_A < k_B$

3) In case 1: **a)** k_A and k_B increase with T **b)** k_A and k_B decrease with T **c)** k_A and k_B are independent of T

4) In case 2: **a)** k_A increases while k_B decreases with T **b)** k_A decreases while k_B increases with T **c)** k_A and k_B are independent of T

5) In case 1: **a)** q''_x in A q''_x in B increase with x **b)** q''_x in A q''_x in B decrease with x **c)** q''_x in A q''_x in B do not depend on x

6) In case 2: **a)** q''_x in A q''_x in B increase with x **b)** q''_x in A q''_x in B decrease with x **c)** q''_x in A q''_x in B do not depend on x

7) In case 1 at the interface of A and B: **a)** $q''_{x,A} = q''_{x,B}$ **b)** $q''_{x,A} > q''_{x,B}$ **c)** $q''_{x,A} < q''_{x,B}$

8) In case 2 at the interface of A and B: **a)** $q''_{x,A} < q''_{x,B}$ **b)** $q''_{x,A} = q''_{x,B}$ **c)** $q''_{x,A} > q''_{x,B}$

9) In case 1 if L_A were doubled and the boundary temperatures remained the same:

a) q''_x in A would decrease q''_x in B would be unchanged **b)** q''_x in A and B would decrease **c)** q''_x in A and B would be unchanged

10) In case 2 if L_A were doubled and the boundary temperatures remained the same:

a) q''_x in B would decrease q''_x in A would be unchanged **b)** q''_x in A and B would decrease **c)** q''_x in A and B would be unchanged