

- 13** The contents of a refrigerator are at a constant temperature, and the surroundings of the refrigerator are at a higher temperature. As a result, heat is transferred into the refrigerator from the surroundings. With the help of the cooling mechanism, heat from the refrigerator is also removed at the same rate.

The first law of thermodynamics may be applied to the contents of the refrigerator. This law is represented by  $\Delta U = Q + W$ , where  $\Delta U$  is the increase in internal energy of the contents,  $Q$  is the net heat supplied to the contents, and  $W$  is the work done on the contents.

For the contents of the refrigerator, which of the quantities  $\Delta U$ ,  $Q$  and  $W$  is/ are zero?

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|----------|-----------------|----------|--------------------------|
| <b>A</b> | $\Delta U$ only | <b>B</b> | $Q$ only                 |
| <b>C</b> | $W$ only        | <b>D</b> | $\Delta U$ , $Q$ and $W$ |