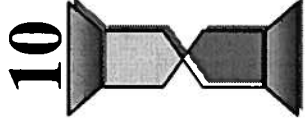
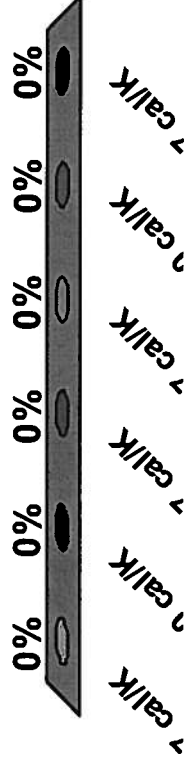


A hot (500K) body transfers 20 cal of heat to cool (300K) body, in isolation. During this process, the change in the total entropy of this two body system is



- a) - 0.067 cal/K
- b) - 0.040 cal/K
- c) - 0.027 cal/K
- d) +0.027 cal/K
- e) +0.040 cal/K
- f) +0.067 cal/K



The correct answer is (d): +0.027 cal/K

- By definition, the change in entropy is
- $\Delta S = +Q_{\text{in}}/T_C - Q_{\text{out}}/T_H$
- (Note that heat ejected at T_H decreases entropy of hot body, and so must have minus sign; also, $|Q_{\text{in}}| = |Q_{\text{out}}| = 20 \text{ cal.}$)
- $= (20/300 - 20/500) \text{ cal/K}$
- $= (0.06667 - 0.04)$
- $= 0.027 \text{ cal/K}$