___ 1 A refrigerator has a coefficient of performance 6. How much heat is rejected to the hot reservoir when 150 kJ of heat are removed from the cold reservoir?

A) 263 kJ
B) 315 kJ
C) 175 kJ
D) More information is needed to answer this question.
E) 125 kJ

___ 2 The temperature gradient in a wall is $155\,^{\circ}\mathrm{C/\,cm}$, and the thermal conductivity of this wall is $4.50 \times 10^{-3}\,\mathrm{cal/(\,s\,cm\,^{\circ}C)}$. The amount of heat conducted per minute per square centimeter through this wall is approximately

A) $34400.\,\mathrm{cal\,cm^{-2}\,min^{-1}}$ B) $0.698\,\mathrm{cal\,cm^{-2}\,min^{-1}}$ C) $0.00174\,\mathrm{cal\,cm^{-2}\,min^{-1}}$
D) $41.9\,\mathrm{cal\,cm^{-2}\,min^{-1}}$ E) $2.07 \times 10^{6}\,\mathrm{cal\,cm^{-2}\,min^{-1}}$

___ 3 Consider thermal conduction through a composite material made of two layers, A and B. Layer A is 2.0 times as thick as layer B, and the thermal conductivity of material A is 3.0 times that of material B. If the temperature on the outside surface of A is $75\,^{\circ}\mathrm{C}$ and the temperature on the outside surface of B is $5\,^{\circ}\mathrm{C}$, find the temperature at the interface of the two materials when a steady state of heat flow has been established.

A) $40\,^{\circ}\mathrm{C}$ B) $33\,^{\circ}\mathrm{C}$ C) $61\,^{\circ}\mathrm{C}$ D) $26\,^{\circ}\mathrm{C}$ E) $47\,^{\circ}\mathrm{C}$

___ 4 A string under tension carries a transverse wave traveling at speed v. If the tension in the string is changed to 25% of its original value, what is the wave speed?

A) 400% of v B) the wave speed is unchanged C) 200% of v
D) 25% of v E) 50% of v

___ 5 A string of mass 0.0024 kg and length 0.60 m vibrates transversely so that it contains half a wavelength that vibrates at its fundamental frequency of 200. Hz. The tension on this string must be approximately

A) 60000. N B) 460. N C) 15. N D) 0.96 N E) 230. N

___ 6 The speed of sound in dry air at $10\,^{\circ}\mathrm{C}$ is 343 m/ s. The speed of sound in dry air at $50\,^{\circ}\mathrm{C}$ is

A) 767 m/ s B) 366 m/ s C) 321 m/ s D) 391 m/ s E) 1715 m/ s