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**Assignment**

**Q the values of the material constant β for thermistors P and Q are 4000 K and 3000 K, respectively. The resistance of each thermistor at 298K is 2KΩ.At 373K the ratio of thermistor P to thermistor Q will be closest to**

**(A) 1.33**  **(B) 1.00**  **(C) 0.75**  **(D) 0.50**

**Solution**

The resistance of thermistor at a temperature θ is given as where θ1 is the reference temperature and Rθ1 is the resistance of thermistor at the reference temperature.

Let **RPθ** be the resistance of thermistor P at temperature and **RQθ** be the resistance of thermistor Q at temperature θ. Let **βP** and **βQ** be their respective material constants. As θ=373K and θ1=298K

Since Rpθ=Rqθ=2kΩ and βp=4000 K and βq=3000 K the equation can be written as-

This implies that

Therefore

Hence the ratio of resistances of thermistor P and Q is 0.509 which is closest to **(D) 0.50**