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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 ϴ 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**