Name:_____Date:_____Course:_____Professor: _____

T4a Prelab (1007): Thermal Expansion

Read lab instructions before answering the questions

1. Bob is an engineering student who has designed a bridge made completely out of steel. The bridge is 985 m long at the lowest recorded temperature in the area T = -45 °C. Bob knows that the coefficient of linear expansion for steel is $\alpha = 12 \times 10^{-6}\ °C^{-1}$. If the highest recorded temperature in the area is T = 43 °C, how much should Bob expect the bridge to expand?

2. Bob built a scale model of the bridge that is 2.637 m long at the lowest temperature (T = -45 °C) using an unknown material. When the temperature reaches the highest value (T = 43 °C), he measures again the length of the bridge finding that it has expanded ΔL = 5.56 mm. Calculate the coefficient of linear expansion and find the material Bob used to make his model.