

## **Physics 10154 - Exam #10B**

Answer the following two questions. Be sure to clearly indicate your answer with a circle or box. Show all work. If I cannot see how you arrived at an answer, I will deduct points!

1. Helium gas is stored in a tank with a volume of 75 L at a pressure of 120 atm and a temperature of  $-35^{\circ}\text{C}$ . When the gas is pumped out of the tank and into children's balloons, it is at a pressure of 1.0 atm and a temperature of  $25^{\circ}\text{C}$ . If a typical balloon has a radius of 13 cm, how many balloons can be filled from one tank of gas?

2. A 250 gram lump of ice at a temperature of  $-25^{\circ}\text{C}$  is placed in a 4.5 kg iron pot at a temperature of  $93^{\circ}\text{C}$ . What is the final temperature of the system? If the final temperature of the system is  $0^{\circ}\text{C}$ , then state how much of the ice melts.

The following constants are given in mks units.

The specific heat of iron is 448.

The specific heat of ice is 2090.

The specific heat of water is 4186.

The latent heat of fusion for water is 333,000.