NAME _____

STUDENT No. _____

SECTION No. _____

1 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	26 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	51 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	76 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	101 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	27 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	52 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	77 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	102 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	28 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	53 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	78 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	103 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

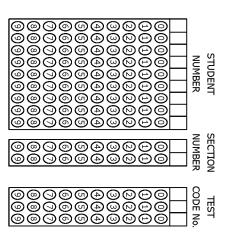**Q1.** In an isobaric process, an ideal monatomic gas absorbs 30.7 J of heat. What is the change in the internal energy of the gas in this process?

A) 18.4
B) 51.2
C) 43.0
D) 21.9
E) 46.0

$$\Delta E_{int} = n C_v \Delta T \Bigg\} \quad \frac{\Delta E_{int}}{Q} = \frac{n C_v \Delta T}{n C_p \Delta T} = \frac{C_v}{C_p}$$
$$Q = n C_p \Delta T$$

$$\Delta E_{int} = \frac{C_v}{C_p} Q = \frac{\frac{3}{2} R}{\frac{5}{2} R} Q = \frac{3}{5} Q = \frac{3}{5} 30.7 = 18.4 J$$

Q2. An ideal gas initially at a pressure of 0.936 atm and temperature 64.7 °C undergoes an isothermal expansion to twice its original volume. During the expansion, the gas absorbs 90.0 kJ of heat. Find the number of moles for this gas?

A) 46.2
B) 241
C) 60.6
D) 69.8
E) 29.6

$$\text{Isothermal} \Rightarrow \Delta T = 0 \Rightarrow \Delta E_{int} = n C_v \Delta T = 0$$

$$\Delta E_{int}^{0} = Q - W \Rightarrow Q = W = n R T \ln \frac{V_f}{V_i}$$

$$n = \frac{Q}{R T \ln \frac{V_f}{V_i}} = \frac{90 \times 10^3}{8.31(64.7 + 273.15) \ln 2} = 46.2$$

23 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	48 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	73 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	98 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	123 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
24 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	49 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	74 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	99 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	124 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
25 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	50 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	75 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	100 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	125 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ