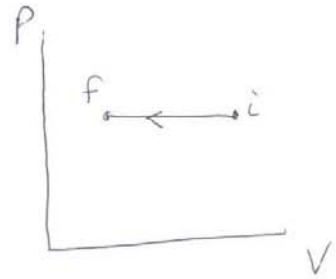Name: Key   Id#:   Sect#:

In a constant pressure process, heat is removed from 5 mole of oxygen gas (diatomic) initially at 300 °C. The final temperature of the gas is 100 °C. Find;

(a) The work done on the gas

$$W = P \Delta V = n R \Delta T$$

$$= 5 \times 8.31 \times (100 - 300)$$

$$= \boxed{-8310\ J}$$

(b) The change in internal energy of the gas

$$\Delta E_{int} = n C_v \Delta T = n \frac{5}{2} R \Delta T$$

$$= 5 \times \frac{5}{2} \times 8.31 \times (-200)$$

$$= \boxed{-20775\ J}$$

(c) The heat removed from the gas.

$$Q = n C_p \Delta T = n \frac{7}{2} R \Delta T$$

$$= 5 \times \frac{7}{2} \times 8.31 \times (-200)$$

$$= \boxed{-29085\ J}$$

or

$$Q = \Delta E_{int} + W$$

$$= -20775 - 8310$$

$$= \boxed{-29085\ J}$$