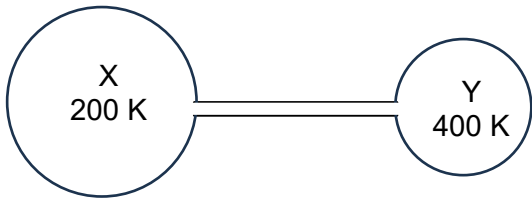10   In the diagram, the volume of bulb X is twice that of bulb Y. The system is filled with an ideal gas and a steady state is established with the bulbs X and Y at temperature 200 K and 400 K respectively.

If the mass of gas in X is m, what is the mass of gas in Y?

A $\dfrac{m}{4}$

B $\dfrac{m}{2}$

C m

D $4m$

11   One mole of ideal gas is contained within a cylinder by a frictionless piston and is initially at