

### Q. 05

Is it possible to increase the temperature of a gas without adding heat to it? Explain.

**Sol.** During adiabatic compression the temperature of gas increase while no heat is given to system

**In adiabatic compression**  $dQ = 0$

$$dQ = dU + dW$$

$$\therefore dU = -dW$$

So in compression work is done on system **WD (-) ve**. So  $dU$  + ve and increase the temperature of system.

So as internal energy of gas (ideal) increases its temperature increases.