

4. A gas undergoes change from state A to state B. In this process, the heat absorbed and work done by the gas is 5 J and 8 J, respectively. Now gas is brought back to A by another process during which 3 J of heat is evolved. In this reverse process of B to A:
- A) 10 J of work will be done by the gas.
  - B) 6 J of work will be done by the gas.
  - C) 10 J of work will be done by the surroundings on the gas.
  - D) 6 J of work will be done by the surroundings on the gas.

(JEE Mains'17)

Ans: D)

Explanation:

For  $A \rightarrow B$ ,  $Q=5\text{J}$ ,  $W=-8\text{J}$ ,  $\Delta U_{AB} = Q+W=-3\text{J}$

For  $B \rightarrow A$ ,  $Q=-3\text{J}$  but  $\Delta U_{BA}=3\text{J}$ , Hence  $W$  has to be equal to  $+6\text{J}$  for this process. Hence work is done on the system.