**3.*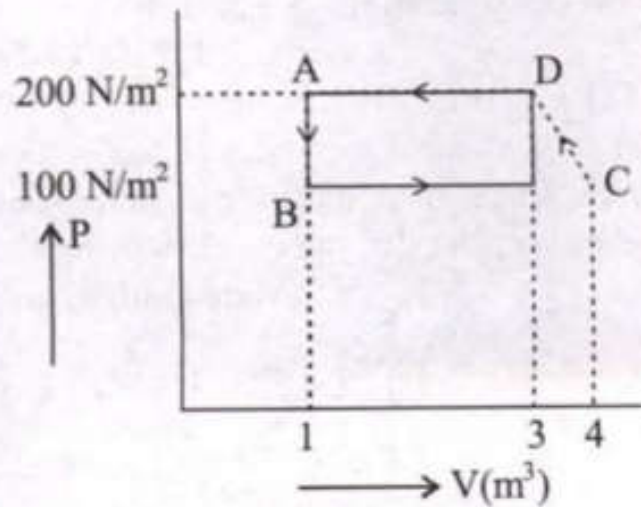* The P-V diagram of a diatomic ideal gas system going under cyclic process as shown in figure. The work done during an adiabatic process CD is (Use $\gamma = 1.4$):

(a) -500 J   (b) 200 J   (c) -400 J   (d) 400 J

ans   **(a)** Work done during adiabatic process CD,

$$W_{C \cap D} = \frac{P_C V_C - P_D V_D}{\gamma - 1}$$

$$= \frac{100 \times 4 - 200 \times 3}{1.4 - 1}$$

$$= \frac{400 - 600}{\dfrac{2}{5}} \, J = -500 \, J$$