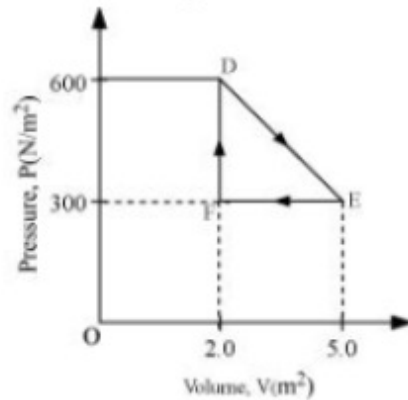


QUES 04:-

A thermodynamic system is taken from an original state to an intermediate state by the linear process shown in figure.



Its volume is then reduced to the original value from E to F by an isobaric process. Calculate the total work done by the gas from D to E to F.

Sol. Total work done by the gas from D to E to F = Area of $\triangle DEF$

$$\text{Area of } \triangle DEF = \frac{1}{2} DE \times EF$$

Where,

$$\begin{aligned} DF &= \text{Change in pressure} \\ &= 600 \text{ N/m}^2 - 300 \text{ N/m}^2 \\ &= 300 \text{ N/m}^2 \end{aligned}$$

$$\begin{aligned} FE &= \text{Change in volume} \\ &= 5.0 \text{ m}^3 - 2.0 \text{ m}^3 = 3.0 \text{ m}^3 \end{aligned}$$

$$\text{Area of } \triangle DEF = \frac{1}{2} \times 300 \times 3 = 450 \text{ J}$$

Therefore, the total work done by the gas from D to E to F is 450 J.