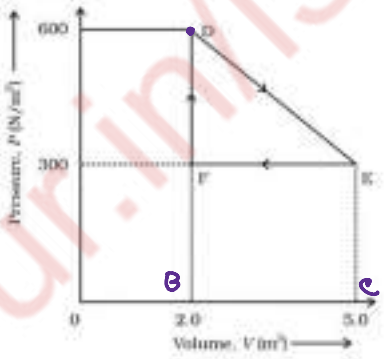
EXAMPLE: A thermodynamic system is taken from an original state D to an intermediate state E by the linear process shown in Fig. Its volume is then reduced to the original value from E to F by an isobaric process and then it taken to its initial state D. Calculate the total work done by the gas from (i) D to E (ii) E to F (iii) F to D and (iv) total work in the cyclic process.



Sol: (1) **D → E :**

W_{DE} = +area under the line DE

= +area □ DECBD

$= +\left(\frac{BD+CE}{2}\right) \times BC = \left(\frac{600+300}{2}\right) \times 3$

$= +450 \times 3 = +1350\ J$

(11) **E → F :** W_{EF} = −(area under the line EF)