$= hf_1 + x_1 hfg_1 - hf_2 = h_1 - hf_2$

= heat rejected during cd $= x_2 hf_2$.

Work Done = Heat absorbed − Heat rejected.

$= (h_1 - hf_2) - x_2 hfg_2 = h_1 - (hf_2 + x_2 hfg_2) = h_1 - h_2$

This shows that work Done during the cycle is equal to the difference b/w Total heats at point b & C.

$$\text{Efficiency} = \frac{\text{work Done}}{\text{heat supplied}} = \frac{h_1 - h_2}{h_1 - hf_2}$$

**Q:10** Define the term Equivalant Evapouration?

**Ans** It is the quantity which when multiplied by the Amount of steam Genrated at a given Pressure from water at a given temp. gives the equivalant evapouration from and at 100°C

if f = fector of Evapouration.

Then equivalant evapouration from and at 100°C

= Actual evapouration × f

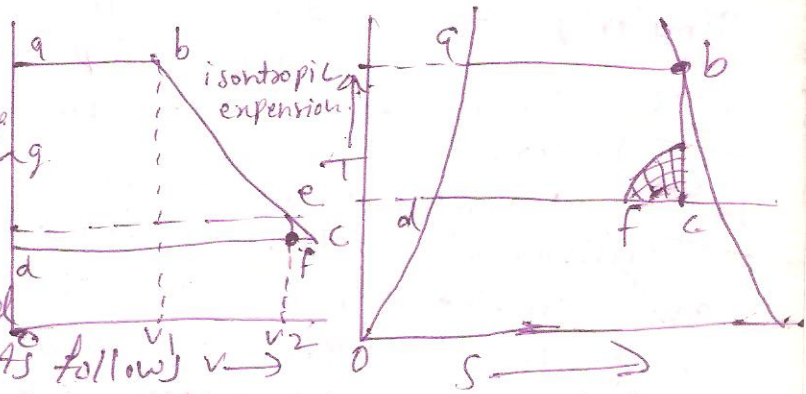
$$= \text{Actual evapouration} \times \left(\frac{h - hf_1}{2258}\right)$$

$$\boxed{F = \frac{h - hf_1}{2258}}$$

**Q:11** Explain the Principle of Regenerative Rankine cycle.

**Ans:-** **Modified Rankine cycle:** The Area of the P-V diag. of the Rankine cycle represents the work Done. The work Done obtained near the toe end of P-V diagram is very small. It is not even Sufficient to overcome the work lost in friction due to reciprocating Parts.

The adiabatic expension is Terminated at e the Pressure is then Allowed to drop Suddenly to $P_3$ at Const-Volume. The line ef Represents this operation.




The work Done during the modified Rankine cycle can be calculated As follows

Let $P_1 V_1 U_1$ and $h_1$ Apply to initial condition of Steam at b

$P_2 V_2, U_2$ and $h_2$ apply to condition of Steam at C

$P_3$ and $hf_3$ apply to condition of water at d

Work Done during the cycle /kg of Steam.

= area abefd = area gabe + area gefd

$= (h_1 - h_2) + (P_2 - P_3) \times V_2$

heat Supplied $= h_1 - hf_3$

The modified Rankine $\eta = \dfrac{(h_1 - h_2) + (P_2 - P_3) \times V_2}{h_1 - hf_3}$.