Q:8 explain the Terms.

Ans:- <u>Chimney Efficiancy</u>: As the height of chimney depends upon temp. of hot Gases leaving the chimney. This means that natural or chimney draught created at the cost of thermal Efficancy of the boiler plant. In artifical draught the flue Gases can be made to leave chimney at a reduced temp and thus amount of heat being carried away by the flue Gases would be less in this case.

let T = temp. of flue Gases, T_2 = temp. of flue gases in artifical draught. The Extra heat carried away by one kg. of flue gas due to higher temp. required to produce the Natural draught.

$$= 1 \times C_p (T - T_2) \text{ kJ}$$

Natural draught in Terms of coloumn of hot Gases.

$$= H\left[\left(\frac{M}{M+1}\right) \times \frac{T}{T_1} - 1\right] m.$$

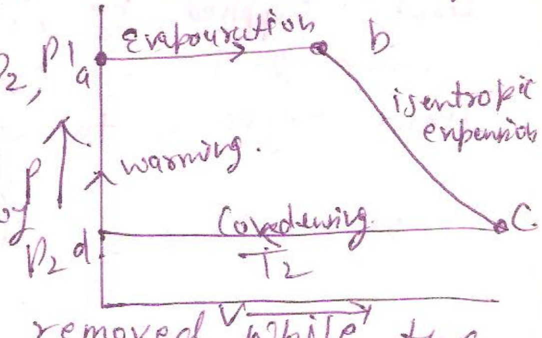
The Efficancy of chimney is

$$\eta = \frac{H\left[\left(\frac{M}{M+1}\right) \times \frac{T}{T_1} - 1\right]}{C_p (T - T_2)} < 1\%$$

Q:9 Discuss the effect of operating condition on the Performance of Rankine cycle?

Ans:- Rankine cycle is the ideal cycle on which a steam engine works. Let us consider one kg. of water at a temp. of T_2 and under a pressure of P_2 bar absolute.

(i) Operation da: A hot body is supplied to this one kg. of water in the cylinder such that its pressure and temp. are raised from P_2, T_2 to P_1 and T_1,



(ii) Operation ab: Evaporation of water takes place at constt. pressure. A certain amount of latent is gained from the hot body.

(iii) operation bc: At b the hot body is removed while the steam is Allowed to expand iscentropically to the pressure P_2 and volume V_2. The temp. also falls to T_2. A certain amount of work is done on the piston.

(iv) operation cd: Heat is Rejected by the steam to the cold body brought in contact with it. The heat is Rejected at Constant Pressure and the steam Gets condensed into water. Thus the cycle is completed.

<u>Efficency of Rankine cycle</u>.

Total heat absorbed = heat absorbed during dA + Heat absorbed during ab

$$= (h_{f1} - h_{f2}) + x_1 h_{fg1}$$