Heat Balance Sheet per Kg of coal fired.

Heat supplied (KJ)	%	Heat expenditure (KJ)	%
Gross heat supplied.		a.) Heat utilized in steam Engine b.) Heat carried away by flue Gases. c.) Heat utilized in evapourating and super heating the moisture in fuel and water vapour formed due to burning of hydrogen. d.) Heat lost due to incomplete combustion--- e.) Heat carried away by excess air--- (f) Heat carried away by carbon in Ash--- g) Heat unaccounted for such as radiation and error etc.	
Total.	100	Total	100

Q:4 what are boiler accessories and mountings?

Ans:- Boiler mountings:- Boiler mountings are those fittings which are primarily intended for the saftey of boiler and for complete control of the Process of steam Generation.

1. Two water level indicator
2. Fusible Plug.
3. Steam Stop valve
4. Feed check valve
5. Blow off cock
6. Two Saftey valve
7. Pressure Gauge
8. man and mud hole.

Boiler Accessories:- These are the Appliances which are installed to increase the efficency of the steam power plant and to help in the proper working of boiler unit.

1. Feed Pump.
2. Steam Injector.
3. Economiser and feed heaters.
4. Super heater.
5. Air Preheater

Q5:- What do you understand by efficency of a boiler and equivalent evapouration?

Ans:- Factor of Evapouration: It is the quantity which when multiplied by the Amount of steam Generated at a given Temp. from water at given temp. gives the equivalent evapouration from and at 100°C.

F= factor of evapouration.

The equivalent evapouration from at 100°C.

= actual evapouration × F

= actual evapouration × $\left(\frac{h-h_{f1}}{2258}\right)$.

$$F = \frac{h-h_{f1}}{2258}.$$

Boiler Efficiency: it is the ratio of the heat actually utilized in Generation of steam to the heat supplied by the fuel in the same period.

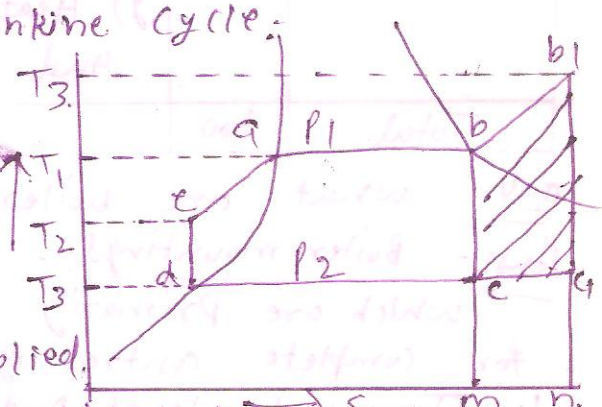
$$\text{Boiler Efficiency} = \frac{m_a (h - h_{f1})}{C}$$

where m_a = mass of water actually evapourated into steam per kg of fuel at the working Pressure.

C = calorific value of fuel in KJ/kg.

Q:6 Discuss the Effect of Superheat, maxm pressure and exhaust Pres on Performance of Rankine cycle.

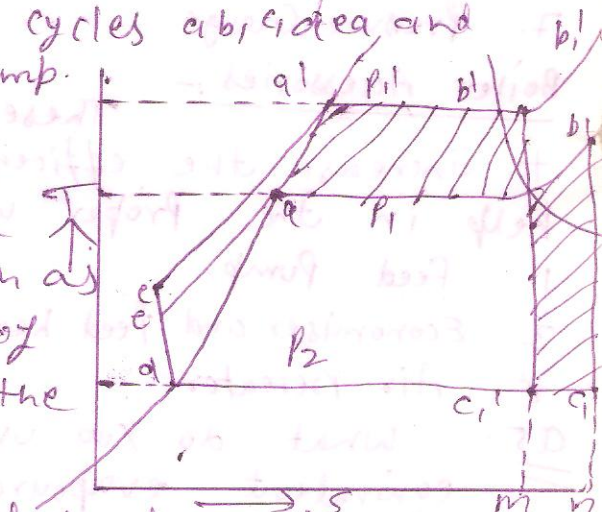
Ans Effect of Superheating :-



Let abc dea using dry saturated heat steam and ab_1c_1dea using superheated steam. The extra work Done using Extra heat shown by area bb_1nm.

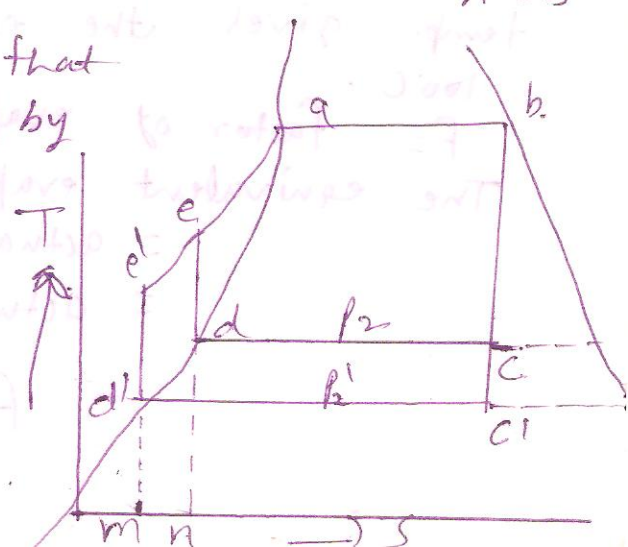
The superheating increases the average temp. at which steam would be supplied to the engine or turbine thereby resulting in an increase in the cycle Efficiency of the cycle.

Effect of maxm Pressure: The two cycles ab_1c_1dea and $a'b'c_1'd'e'a'$ have the same minm inlet temp. and the exhaust pressure P_2 but $P_1' > P_1$



the increase and decrease in Network is Almost Same, However there will be considerable decrease in heat rejection as in Area $c_1'c_1nm$. The Average temp of heat addition Also increases with the increase in supply pressure.

Effect of Exhaust Pressure: The effect of reducing exhaust pressure from P_2 to P_2'. In this case while the network increase As shown by the Area $cc'd'e'edc$ the heat supplied Also correspondly increase as given by the Area enmel. These two Areas are Almost Same.



from the foregoing discussions we see that the Rankine efficiency can be increased by

1. Using superheated steam.
2. Increasing Steam Supply Pressure i.e maxm Pres.
3. Decreasing exhaust or Condensor Pressure.