

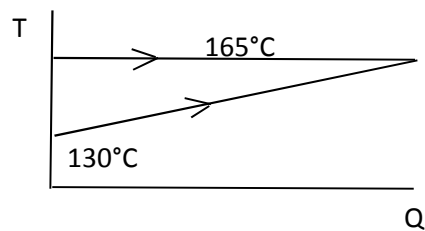
Esercizio 1:

	Degasatore	preriscaldatore 5
Vapore da turbina:		
p, bar	7	39.8
T saturazione, °C	165	250
Dhcond, kJ/kg	2066	1715
cp medio cond, kJ/kg-K		4.76
Acqua da preriscaldare		
G in, kg/s	150	
Tin, °C	130	210
cp medio, kJ/kg-K	4.27	4.47

DT minimo vapore-acqua riscaldata = 3 °C
 DT minimo condensato-acqua in ingresso = 5 °C

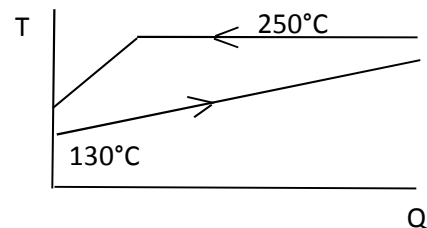
c) Degasatore:

T acqua in uscita	165 °C
DT acqua	35 °C
Dh acqua	149.5 kJ/kg
Q acqua	22418 kW
G vapore	10.85 kg/s
G acqua out	160.85 kg/s



Preriscaldatore n°5:

G acqua in	160.85 kg/s
T acqua in uscita	247 °C
DT acqua	37 °C
Dh acqua	165.39 kJ/kg-K
Q acqua	26603 kW
T out condensato	215 °C
DT condensato	35 °C
Dh sottoraffr. condensa	166.6 kJ/kg
Dh cond + sottoraffredd.	1881.6 kJ/kg
G vapore	14.14 kg/s



Esercizio 2:

LHV CH4	802 MJ/kmole
eccesso aria =	10 %
xO2 aria =	0.21
xN2 aria =	0.79
MMCH4, kg/kmole	16
MMO2, kg/kmole	32
MMN2, kg/kmole	28
MMCO2, kg/kmole	44
MMH2O, kg/kmole	18

a) CH4 + 2O2 -> CO2 + 2H2O

λstech =	2 moliO2/moleCH4
N2/O2 aria =	3.76 moliN2/moliO2
λstech =	9.52 moli aria/moleCH4
λ =	10.48 moli aria/moleCH4
MMaria =	28.84 kg/kmole
α =	18.88 kgaria/kgCH4
Gfumi =	19.88 kgfumi/kgCH4
zCO2 =	1 kmoliCO2/kmoleCH4

zH2O =	2 kmoliH2O/kmoleCH5
zO2 =	0.20 kmoliO2/kmoleCH4
zN2 =	8.28 kmoliN2/kmoleCH4
ztot =	11.48 kmoli_fumi/kmoleCH4
xCO2 =	0.087 kmoliCO2/kmolefumi
xH2O =	0.174 kmoliH2O/kmolefumi
xO2 =	0.017 kmoliO2/kmolefumi
xN2 =	0.721 kmoliN2/kmolefumi
MMfumi =	27.7 kg/kmole
yCO2 =	0.138 kgCO2/kgfumi
yH2O =	0.113 kgH2O/kgfumi
yO2 =	0.020 kgO2/kgfumi
yN2 =	0.728 kgN2/kgfumi

b) cpCO2 =	39.2 kJ/kmole-K
cpH2O =	34.3 kJ/kmole-K
cpO2 =	30 kJ/kmole-K
cpN2 =	29.5 kJ/kmole-K
cp, fumi =	31.19 kJ/kmole-K
cp, fumi =	1.13 kJ/kg-K
Qloss, irr =	1 %
Tcamino =	90 °C
Tambiente =	25 °C
Qcamino =	73 kJ/kgfumi
Qcamino =	1454 kJ/kgCH4
LHV CH4 =	50.1 MJ/kg
Qcamino =	2.9 %LHV
eta caldaia =	96.1 %LHV

c) ECO2 =	2.75 kgCO2/kgCH4
ECO2 =	54.9 gCO2/MJLHV
ECO2 =	57.1 gCO2/MJu