

## 7. Combined gas-steam power plant.

Ex1: Consider the combined cycle where the topping cycle is a gas turbine cycle with pressure ratio 8 and the difference of the temperature  $T_{\text{low}} = 300\text{K}$  and  $T_{\text{high}} = 1300\text{K}$  with the efficiency of the compressor 80% and gas turbine 85%. Bottoming cycle is the ideal Rankine cycle, where the superheated steam has 7MPa and 500 C, the condenser pressure is 7kPa. The exhaust gasses leave the heat exchanger at 450K. Draw the T-s diagram and sketch of the power plant, calculate the steam /gas mass ratio for 100% efficient heat exchanger using the energy balance. Calculate the thermal efficiency of the cycle.