EX-1 ve EX-2 yaz veya fotokopi kes.

Ex_1) Water is working fluid in an ideal rankine cycle. Superheated vapor enters the turbine in 8 MPa and 480°C. The condenser pressure is 8 kPa Net power output of the cycle is 100 MW. Determine for the cycle; First Draw T_s diagram.

(a) The rate of heat transfer to working fluid passing through the steam generator in kW,

(b) Thermal efficiency

(c) The mass flow rate of condenser cooling water in kg/h, if the cooling water enters the condenser at 15°C and exits at 35°C with negligible pressure change.

Ex-3) Steam at 10 MPa, 600°C enters the first stage turbine of an ideal Rankine cycle with reheat. The steam leaving reheat section of steam generator is at 500°C and the condenser pressure is 6 kPa. If the quality at the exit of second stage turbine is 90 %, determine the cycle thermal efficiency.

Ex:4) Water is the working fluid in an ideal Rankine Cycle. Superheated vapor enters the turbine at 8 MPa, 480 °C. The condenser pressure is 8 kPa. There is an open feedwater heater operating at 0.7 MPa. Saturated liquid exits the feedwater heater at 0.7 MPa. The net power output of the cycle is 100 MW. Determine for the cycle;

a) The rate of heat transper to working fluid passing through the steam generator in kW.

b) The thermal efficiency

c) Mass flow rate of condenser cooling water, in kg/h, if

5) Water is the working fluid in an ideal Rankine cycle. Superheated vapor enters the turbine at 8 MPa, 480°C. The condenser pressure is 8 kPa. The net power output of the cycle is 100 MW. A closed feedwater heater using extracted steam at 0.7 MPa is included. Condensate drains from the feedwater heater as saturated liquid at 0.7 MPa and is trapped into the condenser. The feedwater leaves the heater at 8 MPa and a temperature equal to saturation temperature at 0.7 MPa. Determine for the cycle. Şekil-A CFWH şiz. → Grafik yanda

c) (a) The rate of heat transfer to working fluid passing through the steam generator in kW.

d) (b) The thermal efficiency. $\eta_{cycle} = ?$ $\dot{Q}_{in} = ?$

e) (c) The mass flow rate of condenser cooling water, in kg/h if the cooling water enters the condenser at 15°C and exits at 35°C with negligible pressure change. $\dot{m}_{cw} = ?$

Ex:4) In an ideal Brayton gas power plant the pressure ratio is 8. The temperature of gas at comp. inlet is 300 K and at turbine inlet is 1300 K. By air standart assumption and by considering the changes in specific heats wrt temperature, determine;

a) The exit temperatures at turbine and comp exits

b) The backward work ratio

thermal efficie

Ex:5) If a regenerator with a effectiveness of %80 is connected to the ideal Brayton cycle in previous example (Ex-3), what will be the thermal efficiency of the cycle.