

Calculation Homework 3

Home Assignment 3 – STEAM CYCLE with steam extractions and feedwater preheaters

For the steam cycle shown in the figure below, calculate the:

- Steam extraction mass flows in points b. and c.
- Electrical power output
- Electrical efficiency

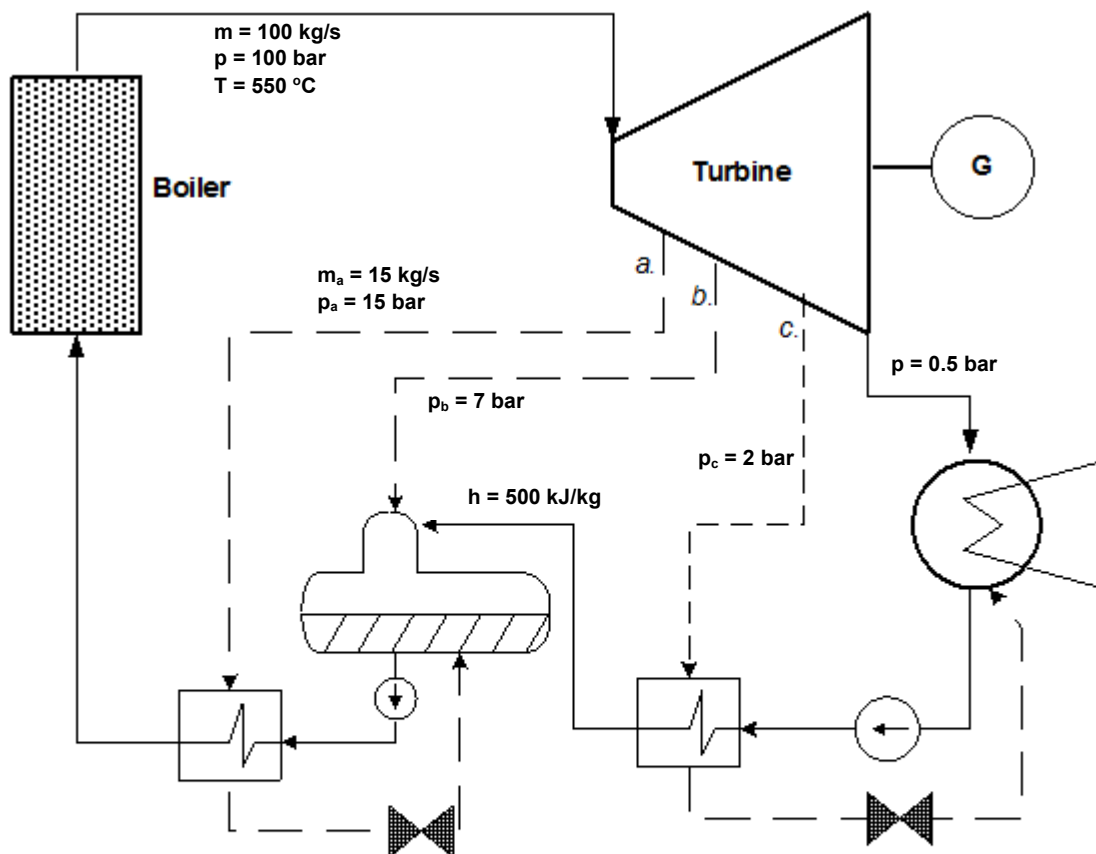
Most of the known parameters are shown in the layout figure. The remainder is listed below.
Neglect the pump work; neglect any heat losses or any pressure losses in the cycle!

Isentropic efficiency of turbine = 85 %

Mechanical efficiency of turbine shaft = 98 %

El. Generator efficiency = 95 %

Boiler thermal efficiency = 90 %



Instructions:

There are two possible ways to handle this assignment (either one or the other):

- 1) A detailed solution on paper with the input parameters given above, including all equations and all sub-procedures for reaching the final results. Try to fit it into 1 sheet of paper (two sides). The paper solution can be submitted to a teacher during any SPG class event.
- 2) A web-based solution, where the assignment is accessed and submitted entirely online in CANVAS. The calculation results - a range of partial and final answers - shall be uploaded directly into CANVAS for an automatic check.

In all cases, the solution procedures and any related questions can be discussed with a teacher during the homework help sessions.

For the online submittal in CANVAS - the assignment should ultimately be solved at 100% correct answers. It remains open and can be restarted unlimited number of times, until solved to 100%.

CANVAS does not function well enough yet! The online submittal option will be improved and updated while the course proceeds. Moreover, CANVAS will not grade the answers properly if any of the answer fields remains empty!

Solving all home assignments in the SPG course with 100% correct answers will provide you with 1.5 credits towards completion of the course (appearing as "ÖVN1" or "Exercise1" in the transcript).