

## Individual assignment No 8

1. A simple steam plant uses a Rankine cycle with one regenerative heater. The boiler produces steam at  $(70+N)$  bar and  $(400+N \cdot 10)$  °C. Then is expanded to  $(0.01+N/100)$  bar isentropically. Define the cycle efficiency. Isentropic efficiency of turbine is  $(85-N)$  %. The work of pump should be neglected. Consider temperature on the outlet of regenerative heater to be equal to average temperature between saturation temperatures in boiler and condenser.
2. Define the efficiency of cycle with two and three regenerative heaters. Consider increasing of the feed water temperature in each heater to be the same. Compare results with 1<sup>st</sup> task.

*N here is number of your variant.*

Note. *Temperature of feed water on the inlet of steam generator should be defined according to following formula:*

$$t_{fw} = t_k + \frac{z}{z+1} (t_{sg} - t_k)$$

*here  $t_k, t_{sg}$  – saturation temperatures at pressures in condenser and steam generator, respectively, °C;  $z$  – number of regenerative heaters.*