Advanced Brayton cycle combined

Which of the following statements is NOT correct?

Answer: Regeneration in a Brayton cycle increases the input heat

Explanation for: Reheating in a Brayton cycle increases the output work & reheating in a Brayton cycle increases the input heat - During reheating processes, we use at least two turbines and a reheater in between. After the gas expands in the first turbine, we reheat it in order to be used in a second turbine. As a consequence, the output and net work increases but also extra heat is needed in the reheater.

Explanation for: Intercooling in a Brayton cycle increases the net work - During intercooling processes, we use at least two compressors and an intercooler in between. After the gas is compressed by the first compressor, the gas is cooled down in the intercooler before entering the second compressor. As a consequence, the input work decreases. This leads to an overall increase of the net work ($w_{net} = w_{out} - w_{in}$).

Explanation for: Regeneration in a Brayton cycle increases the input heat - During regeneration or recuperation processes, part of the heat carried out by the gas at the outlet of the turbine is used to pre-heat the gas that is leaving the compressor and before it enters the combustion chamber. Therefore, less heat needs to be input in the cycle.