To test whether these engine cycles obey 1st Law and the 2nd Law, we check:

1st Law: does $Q_H = Q_C + W_{OUT}$ ?

2nd Law: $\eta_C = 1 - T_C/T_H$

Does $\eta = \frac{W_{OUT}}{Q_H} \leq \eta_C$ ?

a.) Here:

$Q_H = 500J$, $Q_C = 200J$, & $W_{OUT} = 300J$

So: $Q_H = Q_C + W$ 1st Law is OK.

And, $T_H = 600K$ & $T_C = 300K$, so $\eta_C = 0.50$

But, $\eta = \frac{W_{OUT}}{Q_H} = 0.67 > \eta_C$

So 2nd Law is violated.

b.) $Q_H = 500J$, $Q_C = 200J$, & $W_{OUT} = 200J$.

So: $Q_H \neq Q_C + W_{OUT}$ 1st Law violated.

Although: $\eta = \frac{W_{OUT}}{Q_H} = 0.4 < \eta_C \Rightarrow$ 2nd Law is OK.

c.) $Q_H = 300J$, $Q_C = 200J$, & $W_{OUT} = 100J$

So, $Q_H = Q_C + W_{OUT} \Rightarrow$ 1st Law is OK.

And, $\eta = \frac{W_{OUT}}{Q_H} = 0.33 < \eta_C \Rightarrow$ 2nd Law is OK.