

4. With respect to the statement: $Q - W = \Delta H$, which of the following is true?

- a. This is the 1st law applied to an open system
- b. This is the 1st law applied to a closed system
- c. This is the 2nd law applied to an open system
- d. This is the 2nd law applied to a closed system
- e. This represents a combination of the 1st and 2nd laws applied to any system

5. A saturated mixture of water at 125 kPa has a specific entropy of 2.5 kJ/kgK. What is its specific enthalpy?

- a. 445 kJ/kg
- b. 871 kJ/kg
- c. 965 kJ/kg
- d. 1252 kJ/kg
- e. 2693 kJ/kg

6. A real turbine in a Rankine cycle power plant has an isentropic efficiency that is less than 1. Which one of the following statements is true?

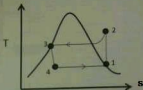
- a. $h_{2,s} = h_1$
- b. $h_{2,s} > h_1$
- c. $h_{2,s} = h_{2,s}$
- d. $h_{2,s} > h_{2,s}$
- e. $h_{2,s} = 0$

7. The efficiency of a heat engine operating between two thermal reservoirs at temperatures of 100 °C and 500 °C may be as high as but not exceed:

- a. 0.200
- b. 0.485
- c. 0.517
- d. 0.809
- e. 1.000

13. Consider a typical household refrigerator. The coils on the outside of the refrigerator—typically behind it, correspond to which of the processes on the T-s diagram below?

- Process 1-2
- Process 2-3
- Process 3-4
- Process 4-1



14. Consider the same T-s diagram from the previous problem. Assuming this cycle is an ideal refrigeration cycle, which is true?

- $h_2 = h_4$
- $h_1 = h_3$
- $P_2 = P_3$
- $P_1 = P_2$
- $P_1 = P_3$

15. The coefficient of performance for a refrigeration cycle is given by:

- Q_c / W_{net}
- Q_H / W_{net}
- W_{net} / Q_c
- W_{net} / Q_H
- $(Q_H - Q_c) / W_{\text{net}}$

11. The idealized cycle that is commonly used to model steam power plants is:
- a. Brayton cycle
 - b. Carnot cycle
 - c. Otto cycle
 - d. Rankine cycle
 - e. Vapor-compression cycle
12. The process whereby a power cycle uses a two-turbine arrangement in which the working fluid is expanded through a first turbine, and then passed through a heat exchanger in the boiler prior to entering the second turbine is known as a(n):
- a. Absorption process
 - b. Cogeneration process
 - c. Economizer process
 - d. Regenerative process
 - e. Reheat process