Assignment 2

The due date for submitting this assignment has passed.

Due on 2021-10-07, 23:59 EDT

Problem 1

1. Which of the following statements is true? 1 point
   - A) Shell and tube exchanger is always more efficient than a plate heat exchanger.
   - B) Shell and tube exchanger is more suitable for high pressure applications.
   - C) Plate heat exchanger is more versatile than shell and tube exchanger.
   - D) Plate heat exchanger is more suitable for high temperature applications.

2. Ashell and tubes exchanger consists of two heat transfer surfaces: the shell and the tubes. The tubes are connected to the shell through the tube sheets. The shell is usually made of steel and is normally constructed of a cylindrical shape and mounted on a support. Both ends are closed to form a jacket in which hot or cold fluid is circulated. The shell is connected to the tube sheet by means of flanges or bolts. The tubes are enclosed within the shell and are supported by the tube sheets. The fluid to be heated or cooled flows through the tubes, while the heat transfer fluid flows outside the tubes and through the shell. The heat transfer coefficient is highest at the tube wall due to the thin layer of fluid and is lowest at the shell wall due to the large mass of fluid. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

3. What is the heat transfer coefficient, h, for the exchanger? 

   - h = 

   - h = 

   - h = 

   - h = 

4. Problem 2

   - Problem 2a: In a shell and tube exchanger, what is the total pressure drop, ∆P, for the exchanger? 0.5 points

   - a) 2 psi
   - b) 4 psi
   - c) 6 psi
   - d) None of the above.

   - Problem 2b: In a shell and tube exchanger, what is the pressure drop, ∆P, for the exchanger? 0.5 points

   - a) 2 psi
   - b) 4 psi
   - c) 6 psi
   - d) None of the above.

5. Problem 3

   - a) All of the above
   - b) Shell and tube exchanger
   - c) External heat transfer
   - d) Internal heat transfer

6. The Reboiler or preheater requires a high pressure air flow to ensure efficient heat transfer. The air enters the exchanger at a high pressure and temperature and is cooled by the hot fluid exiting the exchanger. The cooled air is then used to heat the incoming fluid. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

7. A shell and tube exchanger consists of two heat transfer surfaces: the shell and the tubes. The tubes are connected to the shell through the tube sheets. The shell is usually made of steel and is normally constructed of a cylindrical shape and mounted on a support. Both ends are closed to form a jacket in which hot or cold fluid is circulated. The shell is connected to the tube sheet by means of flanges or bolts. The tubes are enclosed within the shell and are supported by the tube sheets. The fluid to be heated or cooled flows through the tubes, while the heat transfer fluid flows outside the tubes and through the shell. The heat transfer coefficient is highest at the tube wall due to the thin layer of fluid and is lowest at the shell wall due to the large mass of fluid. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

8. The Reboiler or preheater requires high pressure air flow to ensure efficient heat transfer. The air enters the exchanger at a high pressure and temperature and is cooled by the hot fluid exiting the exchanger. The cooled air is then used to heat the incoming fluid. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

9. Convective heat transfer is important in the shell and tube exchanger. The fluid in the shell exchanger is heated or cooled by the fluid in the tubes. The heat transfer coefficient is highest at the tube wall due to the thin layer of fluid and is lowest at the shell wall due to the large mass of fluid. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits. The temperature difference across the exchanger is important in determining the efficiency of the exchanger. The temperature of the shell fluid is typically controlled by the flow rate and the temperature of the fluid entering the shell. The temperature of the tube fluid is controlled by the flow rate and the temperature of the fluid entering the tube. The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

10. Which of the following statements is true? 1 point

   - A) The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.
   - B) The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.
   - C) The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.
   - D) The exchanger is designed to ensure that the temperature difference across the exchanger is maintained within the desired limits.

   - Problem 4

   - Problem 5

   - Problem 6

   - Problem 7

   - Problem 8

   - Problem 9

   - Problem 10