Thermal-Fluid Unit 05: Heat Exchangers

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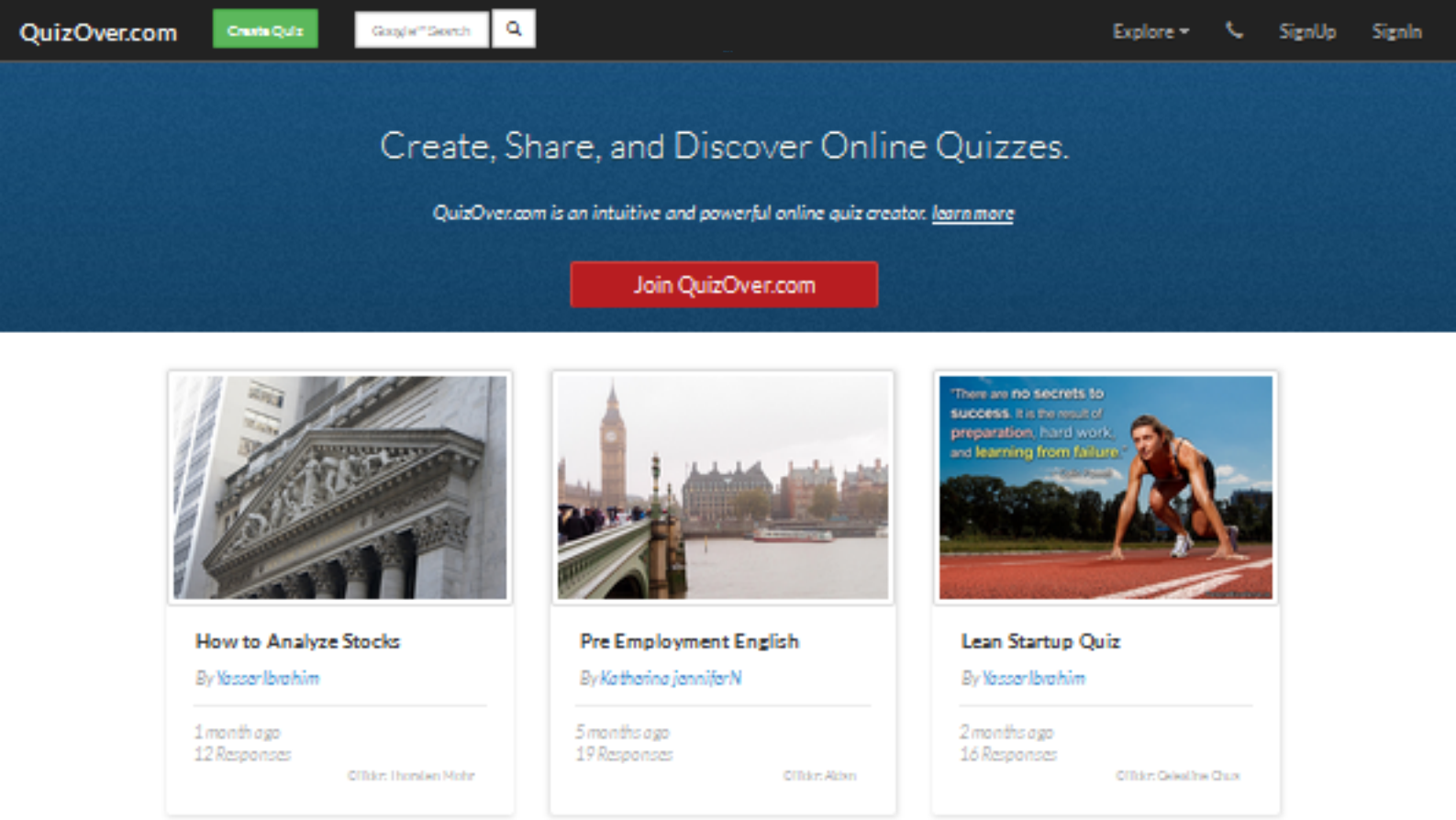
Published 2014



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4. Chapter: Unit 05: Heat Exchangers

1. Unit 05: Heat Exchangers Questions

4.1.1. A countercurrent heat exchanger operates with the following tempera...

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A countercurrent heat exchanger operates with the following temperatures: cold fluid inlet 15°C, cold fluid outlet 25°C, hot fluid inlet 90°C, and hot fluid outlet 30°C. Calculate the logarithmic-mean temperature difference in °C.

Please choose only one answer:

- 45°C
- 30°C
- 27°C
- 25°C
- 50°C

4.1.2. A fluid with heat capacity 2.2 kJ/kg K enters a heat exchanger at 9...

Author: Steve Gibbs

A fluid with heat capacity 2.2 kJ/kg K enters a heat exchanger at 90°C and leaves at 30°C at a flow rate of 5 kg/s. Calculate the heat removal from this fluid.

Please choose only one answer:

- 660 W
- 6.60 kW
- 66.0 kW
- 660 kW
- 66.0 W

4.1.3. A fluid with heat capacity 2.2 kJ/kg K enters a heat exchanger at 9...

Author: Steve Gibbs

A fluid with heat capacity 2.2 kJ/kg K enters a heat exchanger at 90°C and leaves at 30°C at a flow rate of 5 kg/s. If the heat capacity of the cooling fluid for the heat exchanger is 1 kJ/kg K, what is its flow rate in kg/s?

Please choose only one answer:

- 66 g/s
- 6.6 kg/s
- 66 kg/min
- 660 kg/s
- 66 kg/s

4.1.4. If T[sub]lm[/sub] = 27°C, Q = 660 kW, and A = 10 m[sup]2...

Author: Steve Gibbs

If T[sub]lm[/sub] = 27°C, Q = 660 kW, and A = 10 m[sup]2[/sup] for a countercurrent heat exchanger, what is the overall heat transfer coefficient in W/m[sup]2[/sup] K?

Please choose only one answer:

- 24W/m[sup]2[/sup] K
- 242W/m[sup]2[/sup] K
- 2418W/m[sup]2[/sup] K
- 24180W/m[sup]2[/sup] K
- 2.4W/m[sup]2[/sup] K

4.1.5. A countercurrent heat exchanger operates with the following tempera...

Author: Steve Gibbs

A countercurrent heat exchanger operates with the following temperatures: cold fluid inlet 20°C, hot fluid inlet 90°C. The heat capacity of the hot fluid is 2.2 kJ/kg K. The heat capacity of the cold fluid is 1 kJ/kg K. The flow rate of the hot fluid is 5 kg/s. The flow rate of the cold fluid is 66 kg/s. The area for heat transfer is 10 m[sup]2[/sup]. The overall heat transfer coefficient is 2418 W/m[sup]2[/sup] K. What are the outlet temperatures?

Please choose only one answer:

- T[sub]hoto[/sub] = 29.6° C, T[sub]coldo[/sub] = 30.1°C
- T[sub]hoto[/sub] = 29.6° C, T[sub]coldo[/sub] = 40.1°C
- T[sub]hoto[/sub] = 29.6 °C, T[sub]coldo[/sub] = 50.1°C
- T[sub]hoto[/sub] = 19.6° C, T[sub]coldo[/sub] = 20.1°C
- T[sub]hoto[/sub] = 39.6 °C, T[sub]coldo[/sub] = 30.1°C