



MA3010 quiz 8 - Quiz 8 ans

Thermodynamics & Heat Transfer (Nanyang Technological University)



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MA3010 quiz 8

Attempt Score 5 out of 5 points
Time Elapsed 10 minutes out of 15 minutes
Results Displayed Submitted Answers, Feedback

Question 1

For lumped system analysis, the temperature of the body approaches the ambient temperature faster with

- a. Lower body surface area
- b. Lower body heat capacity
- c. Higher convective heat transfer coefficient
- d. Higher body density

Selected Answer: b and c

Question 2

Which of the following statements is true?

- a. The Biot number compares the rate of heat convection at the body surface to the rate of heat conduction within the body.
- b. The Biot number is affected only by the body surface area but not the volume.
- c. The Biot number is the ratio of internal resistance of a body to heat conduction to its external resistance to heat convection

Selected Answer: a and c

Question 3

Which of the following statements about lumped system analysis is false?

Selected Answer: There is temperature variation within the body itself.

Question 4

For real thermal contact between solids,

Selected Answer: Reduces heat transfer through the solids.

Question 5

Which of the following statements is true?

Selected Answer: As long as the thermal resistance between any two given temperatures is known, the steady-state heat transfer rate can be calculated.

Question 1

For real thermal contact between solids,

Selected Answer: Reduces heat transfer through the solids.

Question 2

Which of the following statements is true?

- a. The Biot number compares the rate of heat convection at the body surface to the rate of heat conduction within the body.
- b. The Biot number is affected only by the body surface area but not the volume.
- c. The Biot number is the ratio of internal resistance of a body to heat conduction to its external resistance to heat convection

Selected Answer: a and c

Question 3

What is the criteria for applying the lumped system analysis?

Selected Answer: None of the options

Question 4

What is the thermal resistance of a wall that is experiencing steady-state internal heat generation?

Selected Answer: Thermal resistance depends on the rate of heat generation and boundary conditions.

Response Feedback: For objects with internal heat generation, the thermal circuit analysis does not apply as the object temperature will change over time (non-steady state)

Question 5

Which of the following statements about lumped system analysis is false?

Selected Answer: There is temperature variation within the body itself.

Question 1

Which of the following statements is true?

- a. The Biot number compares the rate of heat convection at the body surface to the rate of heat conduction within the body.
- b. The Biot number is affected only by the body surface area but not the volume.
- c. The Biot number is the ratio of internal resistance of a body to heat conduction to its external resistance to heat convection

Selected Answer: a and c

Question 2

For real thermal contact between solids,

Selected Answer: Reduces heat transfer through the solids.

Question 3

Which of the following statements is true?

Selected Answer: As long as the thermal resistance between any two given temperatures is known, the steady-state heat transfer rate can be calculated.

Question 4

Which of the following statements about lumped system analysis is false?

Selected Answer: There is temperature variation within the body itself.

Question 5

For steady state convective heat transfer, the thermal resistance is dependent on surface temperature.

Selected Answer: False

Attempt Score: 5 out of 5 points

Time Elapsed: 7 minutes out of 15 minutes

Results Displayed: Submitted Answers, Feedback

Question 1

For lumped system analysis, the temperature of the body approaches the ambient temperature faster with

- a. Lower body surface area
- b. Lower body heat capacity
- c. Higher convective heat transfer coefficient
- d. Higher body density

Selected Answer: b and c

Question 2

What is the thermal resistance of a wall that is experiencing steady-state internal heat generation?

Selected Answer: Thermal resistance for heat generation is not applicable.

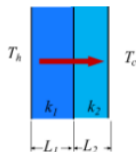
Question 3

For real thermal contact between solids,

Selected Answer: Reduces heat transfer through the solids.

Question 4

For composite wall (of area A) as shown below, the total thermal resistance is:



Selected Answer: $\frac{L_1}{k_1 A} + \frac{L_2}{k_2 A}$

Question 5

What is the criteria for applying the lumped system analysis?

Selected Answer: None of the options