Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1. Which mode of heat transfer involves heat movement of the medium? 1 point
   - Conduction
   - Convection
   - Radiation
   No, the answer is incorrect.

   Accepted Answer: Convection

2. Darcy's law for heat conduction can be represented as
   \[ \Delta T = \frac{q}{A \cdot \alpha} \]
   No, the answer is incorrect.

   Accepted Answer: \[ T_1 - T_2 = \frac{q}{A \cdot \alpha} \]

3. Identify the correct form of equation
   - \[ \Delta T = \frac{q}{A \cdot \alpha} \]
   - \[ \Delta T = \frac{q}{A \cdot \alpha} \]
   - \[ \Delta T = \frac{q}{A \cdot \alpha} \]
   No, the answer is incorrect.

   Accepted Answer: \[ \Delta T = \frac{q}{A \cdot \alpha} \]

4. A thermosyphon having capacity 5.3 m³ maintains the temperature in a chamber with black walls. Consider that air around a thermosyphon is at a temperature of 20°C, the walls are at 30°C. What is the heat transfer coefficient between the thermosyphon and air at 20°C? What temperature will the thermosyphon need if the system is in steady state?
   - 30°C
   - 30°C
   - 20°C
   No, the answer is incorrect.

   Accepted Answer: (30°C)

5. You need to insulate a boiler chamber using ceramic slab. Client gave you data on average temperature of hot and ambient air as 360°C and 20°C respectively. Calculate the Biot number for this case. Take thermal conductivity of slab as 0.14 W/m-K and heat transfer coefficient as 12 W/m²K. Maximum allowable temperature of the slab under boiler can be 120°C.
   - 0.14
   - 0.14
   - 0.14
   No, the answer is incorrect.

   Accepted Answer: (0.14)

6. A room is electrically heated. Its roof is 1.0 m long, 8 m wide and 2.5 m high. It is made of flat panels of emulsion having thermal conductivity 0.15 W/mK. The temperature of outer and inner surfaces of the roof are measured as 25°C and 7°C respectively, for a period of time. Determine total amount of heat loss from the house during the specified period.
   - 1.5410 W
   - 1.5410 W
   - 1.5410 W
   No, the answer is incorrect.

   Accepted Answer: (1.5410 W)

7. If thermal resistance region is found to be length 0.7 m and width 0.2 m, it is made of thin layer of insulating material. The emissivity of this layer is 0.5. Calculate the amount of heat lost by the layer during the specified period.
   - 0.14
   - 0.14
   - 0.14
   No, the answer is incorrect.

   Accepted Answer: (0.14)

8. If for such an electronic panel, at 25°C 25% of the power transferred to the room is 100 W for the whole. What can be - the temperature of the房间? Use the following expression: \[ T = T_0 + \theta \]
   - 0.2°C
   - 0.2°C
   - 0.2°C
   No, the answer is incorrect.

   Accepted Answer: (0.2°C)

9. A copper block has a heat transfer coefficient of 120 W/m²K. It has been found that the rate of heat transfer from copper block is 1300 W/m²K. Find the average heat transfer coefficient.
   - 1300 W/m²K
   - 1300 W/m²K
   - 1300 W/m²K
   No, the answer is incorrect.

   Accepted Answer: (1300 W/m²K)

10. If volumetric and thermal conductivity of engine oil are taken as 0.18 W/m°C and 0.0786 W/m°C respectively. If engine oil is allowed to pass over a heated plate. Compute out of 2 boundary layers, which will be thicker.
   - Thermal boundary layer
   - Thermal boundary layer
   - Thermal boundary layer
   No, the answer is incorrect.

   Accepted Answer: (Thermal boundary layer)

11. If volumetric and thermal conductivity of engine oil are taken as 0.18 W/m°C and 0.0786 W/m°C respectively. If engine oil is allowed to pass over a heated plate. Compute out of 2 boundary layers, which will be thicker.
   - Thermal boundary layer
   - Thermal boundary layer
   - Thermal boundary layer
   No, the answer is incorrect.

   Accepted Answer: (Thermal boundary layer)