

Assignment: 3 CONVECTION

1. Define the Newton's law of cooling under convection? Therefore, state what is local heat transfer coefficient and hence derive an equation for average heat transfer coefficient also state the factors affecting it.
2. Explain Reynold Colburn analogy for laminar flow over a flat plate.
3. Distinguish between natural and forced convection heat transfer. Also define velocity and thermal boundary layer thickness.
4. Using dimensional analysis, obtain a general form of equation for forced convective heat transfer.
5. For natural convective heat transfer, prove that $Nu = \phi (Pr)(Gr)$, where Nu is Nusselt Number, Pr is Prandtl Number and Gr is Grashoff number.
6. What is physical significance of dimensionless parameters? Explain all numbers in brief.
7. Explain with neat sketch Boundary Layer concept and show velocity boundary layer growth due to flow over plate.