Abstract

In this thesis, we will discuss the coolant flows via cylindrical tubes in an automotive radiator. The mathematical model of the radiator system in the form of couples differential equations governing temperature, concentration, and coolant velocity are employed. The solution of the model is obtained by using the Laplace and finite Hankel transforms. The coolant flow velocity, temperature, and concentration analytical expressions are obtained for flow of coolant in radiator. The effects of the order of radiation parameter, metabolic heat source, Peclet number, and other significant parameters are considered, and valuable outcomes are summarized using numerical simulations and graphical demonstrations to validate the arguments for the better choice of coolant and the diameter of the radiator system tubes.