PREFACE

This dissertation entitled "Approximate solution of the boundary layer equations" contains two chapters.

First chapter is introductory which deals with the outline of the boundary layer theory in this chapter we enlisted some major developments in this theory by various research workers and also give some basic concepts as pre-requisite for the problems to be discussed in the second chapter.

The second chapter covers the study of some bouhdary layer problems. Firstly in this Chapter we have studied - Approximate solution of the Pohlhausen's problem of forced convection in Laminar boundary layer on a flat plate and we obtained the solution for cooling problem and also for adiabatic wall in the following form

$$\theta_2 = \gamma - \left(\sum_{i=0}^{4} c_i \eta_i^i \right)^2$$

subject to the boundary conditions

$$\eta_t = 0 : \quad \frac{\partial \theta_2}{\partial \eta_t} = 0 : \quad \frac{\partial^2 \theta_2}{\partial \eta_t^2} = -8 \, Pr \, \Delta^2$$

$$\eta_t = 1 : \quad \theta_2 = 0 , \quad \frac{\partial \theta_2}{\partial \eta_t} = \frac{\partial^2 \theta_2}{\partial \eta_t^2} = 0$$

and we conclude γ is a function of Pr only and calculated J approximately.

Secondly, we have studied the Approximate solution of the Pohlhausen's problem of free convection from heated vertical flat plate to solve first square and later Eckert took the following polynomial in η for the distribution of u and θ in the following form

$$u = u_1(x)\ (1 - \eta)^2$$

$$\theta = (1 - \eta)^2$$

But we choose the following distribution

$$u = u_1(x)\ (1 - \eta)^3$$

$$\theta = (1 - \eta)^3$$

and calculate Grashoff and Nuselt number.

Further we have studied the boundary layer for Howarth's flow (i) past a wedge and (ii) along the wall of convergent channel.

Lastly in this chapter we have studied the Boundary layer with suction along a porous wall in Howarth's flow

$$\frac{dt^*}{d\bar{x}} = \frac{2}{1 - \bar{x}} \left[\ell + (2+H)t^* + \bar{V_s}\, t^{*1/2} \right.$$

$$\frac{dH_s}{d\bar{x}} = \frac{1}{(1-\bar{x})t^*} \left[2D - H_s \left\{ \ell + (H-1)t^* + V_s t^{*1/2} + \right.\right.$$

$$\left.\left. + V_s t^{*1/2} \right\} \right]$$

and discussions have been made.

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