

P R E F A C E

This dissertation entitled "Problems in two dimensional boundary layer theory in Fluid Mechanics" contains two Chapters. First Chapter is introductory which gives brief history of the boundary layer theory and listed the major developments in this theory by various investigators.

Chapter two covers the study of two dimensional boundary layer problems. In this chapter we have studied firstly "The boundary layer flow of a power law liquid past flat plate", and obtained a generalized nonlinear differential equation for a boundary layer flow of a power law liquid past a flat plate by following the formalism of Tapas Ranjan Roy (1980). We obtained in the form

$$nf''' (f'')^{n-1} + ff'' = 0$$

subject to the boundary condition

$$f' = f = 0; \quad n = 0$$

$$f' \rightarrow 1; \quad n \rightarrow \infty$$

Lastly in this chapter we studied "The boundary layer flow of a power law liquid along the wall of a convergent channel and obtained the non-linear differential equation of the type

$$\frac{n(2n)}{n+1} f''' (f'')^{n-1} + \frac{2-2n}{n+1} f f'' + 1 - f'^2 = 0$$

subject to the boundary condition.

$$\begin{aligned} f' = f = 0 & ; & \eta = 0 \\ f' \rightarrow 1 & ; & \eta \rightarrow \infty \end{aligned}$$

This is the generalized equation for boundary layer flow of a power law liquid past along the wall of the convergent channel. Due to the unavailability of Computer facilities in our University we could not obtain the approximate solutions of the above non-linear differential equations for the problems discussed. This is under our investigation in near future.