PREFACE

This thesis is the outcome of the researches carried out by me since 1978, under the supervision of Dr. A.P. Dwivedi, Assistant Professor of Mathematics, H.B.T.I., Kanpur, and is being submitted for the award of Ph.D. degree of Kanpur University.

The thesis has been divided into ten chapters. The first chapter is introductory and deals with the necessity of the study of crack problems in the elastic solids and their applications in Fracture Mechanics. Second chapter deals with the literature survey and gives the historical development of the subject matter. This includes the review of the work done in the beginning of the subject and the latest developments available. The third chapter deals with the determination of the stress-intensity factor for a Griffith crack in a strip which is opened by the pressure applied at Crack faces. This problem has been reduced to Fredholm integral equation of second kind by using Fourier finite transforms. In chapter four the stress intensity factor and
crack shape for two Griffith Cracks in a stress-free strip are evaluated through the solution of Fredholm integral equation. Different kinds of loading of crack faces are also considered. Similarly the chapter five is concerned with the determination of stress and displacement fields in the vicinity of a Griffith Crack in a stress-free strip. The chapter six deals with stress-intensity factor, for Griffith Cracks opened by a wedge in a stress-free strip. The chapters seven and eight deals respectively with the problem of determining the stress and displacement fields in the vicinity of one and two Griffith Cracks in a stress-free strip opened by a symmetrical system of body forces. In chapters nine and ten the problems of exterior Griffith Cracks are considered in which the body forces are acting.

In the last, we have attached the reprints of our research papers which have been available till date and are included in the thesis.

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