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KAJIAN KEJURUTERAAN, I.T.M., SHAH ALAM

COMPUTER AIDED ANALYSIS USING  
FINITE ELEMENT TECHNIQUES

BY  
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## PREFACE

High speed electronic digital computer have enabled engineers to employ various numerical discretization techniques for approximate solutions of complex problems. The finite element method is one such technique. It was originally developed as a tool for structural analysis but the theory and formulation have been progressively so refined and generalized that the method has been applied successfully to such other fields as heat flow, seepage, hydrodynamic and rock mechanics. As a result of this broad applicability and the systematic generality of the associated computer codes, the method has gained wide acceptance by designers and research engineers. It is now being taught to both students and practising engineers at many universities and will soon be a regular part of the curriculum at almost all colleges of engineering.

In order to apply the finite element method to complex modern problem, engineers must be familiar with the method's fundamental theory, assumptions and limitation. Some background in the diverse mathematical fields associated with the finite element method are required i.e matrix algebra, mechanics, variational methods and computer skills.

This project report is divided into two parts ; Introduction, - Generalization of the theory and applications. Part A is a description of a mathematical method used in finite element

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