"I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

Signed :   ....

Date   :   ......17./.05./.10......

Mohamad Asyraf Bin Mohamed Hussin

UiTM NO: 2007270958

DYNAMIC CHARACTERIZATION OF LAMINATED FIBER COMPOSITES USING FINITE ELEMENT METHOD

MOHAMAD ASYRAF BIN HJ. MOHAMED HUSSIN
(2007270958)

A thesis submitted in partial fulfillment of the requirements for the award of Bachelor Engineering (Hons) (Mechanical)

Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)

MAY 2010

ACKNOWLEDGEMENT

All thanks and praises are due to the Al-Mighty Allah S.W.T, The Merciful and Beneficent for the strength and blessing through out the entire time until completion of this thesis. Peace be upon our prophet Muhammad S.A.W, whose has given light to mankind.

I wish to express my sincere appreciation and gratitude to project advisor, Dato' Dr Prof IR Hj Mohamed Dahalan Mohamed Ramli for his guidance, counsels and for putting much effort through his useful advice in this course.

For all people who involved either directly or indirectly in this course, their contribution is highly appreciated. The kindness, corporation and support from all of the above mentioned people would always be remembered.

Thank You.

ABSTRACT

This project has its own objective that is to determine the dynamic characteristics of laminated fiber composite namely Kenaf fiber in the terms of its natural frequencies and mode shapes by the aid of Finite Element Method.

In previous, researcher has expanded three components of displacement by double Taylor series expansion in the plane of the plate. The coefficient of each term in the double Fourier series is taken as a function of the thickness co-ordinate only. These expansions are such that boundary conditions are exactly satisfied at the edges of the simply supported plate. By earning the eigenvalue and eigenvector, the required parameters then being obtained by the aid of Jacobi Iteration Method. (Based on Euler's method)

In this project, 2 ply of Kenaf fiber plate 170x215mm with a thickness of 6mm is used. Each ply has a thickness of 3mm and being combined together. Five boundary conditions have being considered, free-free, free-end using 1-clamp, 2-clamps, 3-clamps, and 4-clamps. MSC/NASTRAN software is the main (FEM) analysis medium for the project. The results will be compared with other analysis methods. (EMA and RE)

Keywords: Kenaf Fiber plate, Dynamic characteristic, MSC/NASTRAN software.

TABLE OF CONTENTS

CONTENTS	PAGE