

**OSCILLATION CRITERIA FOR SECOND ORDER
NONLINEAR DIFFERENTIAL EQUATIONS
WITH DAMPING**

WACHARONG WONGSANURAK

**MASTER OF SCIENCE
IN APPLIED MATHEMATICS**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

**THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY**

MAY 2009

**OSCILLATION CRITERIA FOR SECOND ORDER
NONLINEAR DIFFERENTIAL EQUATIONS
WITH DAMPING**

WACHARONG WONGSANURAK

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE
IN APPLIED MATHEMATICS**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

Copyright© by Chiang Mai University
All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY


MAY

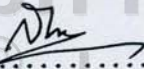
**OSCILLATION CRITERIA FOR SECOND ORDER
NONLINEAR DIFFERENTIAL EQUATIONS
WITH DAMPING**

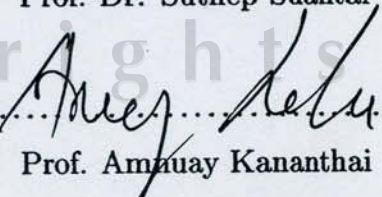
WACHARONG WONGSANURAK

**THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN APPLIED MATHEMATICS**

EXAMINING COMMITTEE

.....  CHAIRPERSON
Asst. Prof. Dr. Gumpon Sritanratana

.....  MEMBER
Prof. Dr. Suthep Suantai

.....  MEMBER
Prof. Amnuay Kananthai

28 May 2009

© Copyright by Chiang Mai University

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisor, Prof. Amnuay Kananthai, for his guidance and encouragement which enable me to carry out my study successfully. My sincere appreciation goes to Assoc. Prof. Dr. Piyapong Niamsup and Asst. Prof. Dr. Gumpon Sritanratana, who read the manuscript and gave valuable suggestions. I also thank all teachers for their valuable lectures during my study at the Department of Mathematics at Chiang Mai University.

I wish to thank all of my friends specifically N. Yotha, J. Thipcha, J. Suprecha, S. Chagrit, K. Mukdasai, S. Pinjai, S. Akekachai for their useful help and warm friendship.

Finally, I am deeply grateful to my family for their loving encouragement and support.

Wacharong Wongsanurak

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved