

سامية محمد مصطفى



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



سامية محمد مصطفى



شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



سامية محمد مصطفى



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



سامية محمد مصطفى



شبكة المعلومات الجامعية



بالرسالة صفحات لم ترد بالأصل



On approximate solution of some types of integral equations

Thesis
Submitted for the Award of
The Degree of Doctor of Philosophy
In Science
(Pure Math.)
By

Sayda Nabhan Oada

Department of Mathematics
Women's University College
Ain Shams University

Supervisors

Prof. Dr. Abd El Azim Anis
Women's University College
Ain Shams University

Prof. Dr. Mohamed Ismail M. Hessein
Faculty of Engineering (Shoubra)
Zagazig University

M. Ismail

Dr. Abd Alla Abd El-Shafy M. Abou El-Seoud
Faculty of Education (El-Arish)
Suez Canal University

Submitted to
Department of Mathematics
Women's University College
Ain Shams University
Cairo, Egypt
2002

Abdalla

B

17 EVC

21

27

2. 2. 2.

1.

the course
another to
Shams
the

 g_i'

جامعة عين شمس - كلية البنات
الدراسات العليا

تاريخ موافقة مجلس إدارة على تشكيل لجنة

فحص المنهج
تاريخ ٩ / ٩ / ٢٠٠٢

وتتكون من :

- ١- السيد الدكتور عبد العظيم أحمد رئيس استاذ الرياضيات (مستشار)
- ٢- السيد الدكتور محمد إبراهيم محمد (مستشار)
- ٣- السيد الدكتور محمد عبد الحميد (مستشار)
- ٤- السيد الدكتور محمد سعيد محمد (مستشار)

تاريخ موافقة مجلس الكلية على التوصية بمنح الطالب

درجة ماجستير
دكتوراه

١ / ١

الموظف المختص

أمين الكلية

١٠ / ١٠ / ٢٠٠٢

١٠ / ١٠ / ٢٠٠٢



١١ / ١٠

2

Acknowledgments

I would like to thank Prof. Dr. Abd El Azim Ahmed Anis, Professor of Pure Mathematics, Department of Mathematics, Women's University College, Ain Shams University, for his fruitful discussions and encouragement.

It is a pleasure to thank prof. Dr. Mohamed Ismail Mohamed Hessein, Mathematical and Natural Sciences Department, Faculty of Engineering (Shoubra), Zagazig University- Benha Branch, for suggesting the topic and for helpful guidance, supervision, patience and numerous discussions and advice during the preparation of this thesis.

I would like also to present my deep appreciation and thanks to Dr. Abd Alla Abd El-Shafy M. Abou El-Seoud, Department of Mathematics, Faculty of Education (Al-Arish) Suez Canal University, for suggesting the topic, his continuous advice, encouragement and supervisorion during the preparation of this thesis.

I wish also to thank Prof. Dr. Safaa Sadek Head of the Department of Mathematics, College of Women's, Ain Shams University , for his interest and continuous encouragement.

Finally, I am grateful to all my professors and colleagues in the Mathematics Department, Women's University College, Ain Shams University, and to every body, who contributed in one way or another to the successful achievement of this thesis, for their help during the course of this work.

CONTENTS

Introduction.....	1
Chapter (I): Auxiliary Theorems and Definitions	5
1.1 Survey on Previous Work	5
1.2 Remarks on the Results of Ref. [22].....	7
1.3 Auxiliary Definitions and Lemmas	9
1.4 Linear Polynomial Methods.....	15
Chapter(II): On Construction of Approximate Solution to Hammerstein	
Integral Equation of the second kind	19
2.1 Introduction	19
2.2 On Construction of Approximate Solution of Hammerstein Integral	
Equation in the Space L_p ($p \geq 1$)	21
2.3 Approximate Solution of Hammerstein Non-Linear Integral	
Equation in the Space C	43
2.4 An Approximate Method to Solve System of Non-Linear	
Algebraic Equations.....	47

Chapter(III): Approximate Method of Solving Second Kind Non-

Linear Volterra Integral Equations.....55

3.1 Introduction.....55

3.2 Approximate Solution of Volterra Non-Linear Integral
Equations in the Space $L_p (p \geq 1)$ 59

3.3 An Approximate Method of Construction for Approximate Solution
to Non-Linear Volterra Equation in the Space C.....71

Chapter(IV): An Approximate Solution of Mixed Additive Non-Linear

Integral Equations in the Space $L_p (p \geq 1)$ 75

4.1 Introduction.....75

4.2 Construction of Approximate Solution for a Non-Linear
Hammerstein- Volterra Integral Equation in the
Space $L_p (p \geq 1)$ 75

4.3 The Approximate Solution of Mixed Additive Non-Linear Delay
Hammerstein –Volterra Integral Equations.....88

4.4 An Approximate Method to Construct Approximate Solution for a
Non-Linear Volterra- Fredholm Integral Equation in the
Space $L_p (p \geq 1)$ 96

References99

Arabic summary

Chapter I

Auxiliary Theorems and Definitions

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100