Table of Contents

Pag	Subject	
e I	الآية	
П	Dedication	
Ш	Acknowledgment	
IV	Table of Contents	
VII	List of Figures	
IX	Abstract	
X	الملخص	
	Chapter One	
	Plan of the Research	
1	Introduction	1.1
1	Problem Definition	1.2
1	Objective of the Research	1.3
2	Importance of the Research	1.4
2	Hypotheses of the Research	1.5
2	Presentation of the Research	1.6

Chapter Two

Literatures Review

- 4 2.1 Introduction
- 5 2.2 Scattering under Central Force
- 5 2.2.1 Rutherford Scattering
- 6 2.2.3 Scattering under Yukawa Potential
- 6 2.2.3 Scattering under Lennard-Jones Potential

Chapter Three

Two Dimensional Central Force Systems

- 7 3.1 Introduction
- 7 3.2 Cylindrical Solid Angle
- 8 3.3 Conservation Laws
- 9 3.3.1 Conservation Law of Angular Momentum
- 9 3.3.2 Conservation Law of Energy
- 9 3.4 Scattering on Two Dimensional Central Force System
- 10 3.4.1 Two Dimensional Central Force
- 10 3.4.2 Differential Scattering Cross Section
- 10 3.4.3 Impact Parameter
- 10 3.4.4 Flux Density
- 10 3.4.5 Scattering Angle
- 11 3.4.6 Derivation of Differential Scattering Cross Section
- 3.4.7 Derivation of Scattering Angle

- 14 3.5 Potential Energy of an Infinite Charged Wire
- 15 3.5.1 Newton's Third Law
- 15 3.5.2 Coulomb's Law
- 16 3.5.3 Electric Field Intensity
- 17 3.5.4 Electrical Potential Energy
- 17 3.5.5 Linear charge Density
- 18 3.5.6 Derivation of Electric Field Intensity of an Infinite Charged Wire
- 3.5.7 Derivation of Electric Potential of an Infinite Charged Wire

Chapter Four

Numerical Methods of Solution

- 23 4.1 Introduction
- 23 4.2 Numerical Calculations
- 4.2.1 First Order Derivative
- 4.2.2 Composite Simpson's Rule
- 4.2.3 Newton's Method
- 4.2.4 Extremes of a Function
- 4.2.5 Removing Singularity
- 4.2.6 Lagrange Interpolation
- 4.3 Method of Solution
- 4.3.1 Estimating of Roots Range
- 4.3.2 Calculating Scattering Angle
- 28 4.3.3 Calculating Differential Scattering Cross

Section

4.3.4 Determining the Ratio between Linear Charge Density and Total Energy

Chapter Five

Results and Discussion

- 30 5.1 Introduction
- 30 5.2 Estimating Range of Rotes
- 32 5.3 Calculating Scattering Angle
- 33 5.4 Calculating Differential Scattering Cross Section
- 34 5.5 Determining the Ratio between Linear Charge Density and Total Energy
- 34 5.6 Recommendation
- 35 References

Appendices

- 37 Appendix A
- 42 Appendix B
- 51 Appendix C
- 57 Appendix D
- 59 Appendix E
- 61 Appendix F
- 63 Appendix G
- 65 Appendix H
- 67 Appendix I