Index

N_o	Subject	page
1	الاستهلال	a
2	Dedication	b
3	Acknowledgement	c
4	Abstract	d
5	Abstract in Arabic	e
6	Index	c
	Chapter one Introduction	
1.1	concept of vacuum	1
1.2	Problems of vacuum energy	1
1.3	Aim of the work	1
1.4	Methodology	1
	Chapter 2 The Big Bang Model	
2.1	Introduction	3
2.2	Basic Concepts	3
2.2.1	The Friedmann- Robertson-Walker Metric	3
2.2.2	The Hubble Constant and Velocities	4
2.2.3	The Red shifting of Light	5
2.2.4	The Concept of Horizon	8
2.2.5	The Einstein Equations for the Robertson-Walker Metric	8
2.3	Types of Matter	16
2.3.1	Matter-Dominated Era	16
2.3.2	Radiation Dominated Universe	18
2.3.3	The vacuum Energy	20
2.4	Cosmological Problems of the Standard big bang Model	21
2.4.1	The Horizon Problem	21
2.4.2	the Entropy problem	23
2.4.3	The Flatness Problem	25

Chapter Three The Generalized field Equation		
3.1	Introduction	29
3.2	The Generalized field Equation Model	29
3.3	The mainly appropriate lagrangian form	32
3.4	Pure Radiation Era	33
3.5	pure vacuum state of universe	34
3.6	Radiation and matter in the presence of vacuum	35
3.7	Cosmological Solutions During Radiation,Matter and Vacuum State of the Universe	37
3.8	Solving the Cosmological Problems	41
Chapter Four **T**he Generalized General Relativity and Quantum Model		
4.1	introduction	46
4.2	The Schrödinger equation for the gravitational field	46
4.3	Vacuum energy	49
4.4	Solution of quantum gravity equation in the early blank and vacuum era.	54
4.5	Non Singular Solution at the early universe	57
Chapter Five Literature Review		
5.1	The2ppi Expansion: Dynamical Mass Generation and vacuum energy	59
5.2	mass quantization in quantum and susy cosmological models with matter content	62
5.3	Point Charge Self Energy In The General Relativity	66
5.4	On Problem of Mass Origin and Self-Energy Divergence in Relativistic Mechanics and Gravitational Physics	70
Chapter 6 Vacuum Energy and mass generation		
6.1	Introduction	79
6.2	vacuum and energy minimization	79
6.3	mass generation	81
6.4	vacuum energy During inflation and vacuum stage	85
6.5	Mass generation at vacuum stage	88

6.6	mass quantization	90
6.7	Neutrino and its properties	95
6.8	The Big Bang Theory equations	97
6.9	The role of the neutrino in the amplification of the universe	98
6.10	Inertial and Gravitation Mass	101
6.11	Discussion	106
6.12	Conclusion	107
	References	108