



**On the Spectra of G_k and the Fair
Sharing Graph of Longest
Path, P_4**

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ABSTRACT

In this paper, we discussed and expounded the proof of the Theorem 2.4 on the article entitled “Graphs with Reciprocal Eigenvalue Properties” by Swarup Kumar and Sukanta Pati. The proof of this theorem relies heavily on a Reduction Formula $P(G; x)$. Further, we extended the Lemma in [1] based on the following: Let v be a vertex in the graph G and $\mathcal{C}(v)$ be the set of all cycles containing v . Then

$$P(G; x) = xP(G - v; x) - \sum_{u \sim v} P(G - u - v; x) - 2\sum_{Z \in \mathcal{C}(v)} P(G - Z; x).$$

We used the above equation to determine the characteristic polynomial of G_k and to Fair Sharing Graph of Longest Path, P_4 . Also, we stated the characteristic polynomial and its roots which determine the spectra of the Class of Graph G_k and Fair Sharing Graph of Longest Path, P_4



TABLE OF CONTENTS

Title Page	1
Abstract	2
Approval Sheet	3
Acknowledgments	4
Table of Contents	5
List of Appendices	7
CHAPTER 1 PROBLEM AND ITS BACKGROUND	
1.1 Introduction	8
1.2 Objectives of the Study	10
1.3 Scope and Limitations	10
1.4 Significance of the Study	11
1.5 Methodology	11
CHAPTER 2 PRELIMINARY CONCEPTS	
2.1 Basic Graph Theory	12
2.2 Adjacency Matrix	13
2.3 Types of Graph	13
2.4 Classes of Graph	15
2.5 Characteristic Polynomial of Graph	16
2.6 Graph Spectrum	18
2.7 Fair Sharing Graph	18



2.8	Isomorphic Graph	19
2.9	Property R and Property SR	19
CHAPTER 3 RESULTS AND DISCUSSION		20
On the Spectra of G_k and the Fair Sharing		
Graph of Longest Path, P_4		
3.1	Proof	20
3.2	Extension of the Lemma [1]	23
CHAPTER 4 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS		27
Cited References		28
Appendices		29



LIST OF APPENDICES

Appendices	Title	Page
A	Article – Graphs with Reciprocal Eigenvalue Properties	30
B	Curriculum Vitae	34