

On The Generalized Non-Commuting Graphs of Dihedral, Semi-Dihedral and Quasi-Dihedral Groups

Mustafa Anis El-Sanfaz^a, Nor Haniza Sarmin^b and

Siti Norziahidayu Amzee Zamri^{*c}

^a*Mathematics Program, Department of Mathematics, Statistics and Physics,
College of Arts and Sciences, Qatar University, 2713 Doha, Qatar*

^b*Department of Mathematical Sciences, Faculty of Science, Universiti
Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia*

^c*UniSZA Science and Medicine Foundation Centre, Universiti Sultan Zainal Abidin, 21300
Kuala Nerus, Terengganu, Malaysia*

*sitinamzee@unisza.edu.my

Abstract

In this paper, G denotes a finite group and Γ denotes a simple graph. Two elements x and y commute if $xy = yx$. The non-commuting graph is a graph whose vertices are non-centrals elements of a group in which two vertices are adjacent if they do not commute. In this paper, the non-commuting graph is extended by defining the generalized non-commuting graph. The generalized non-commuting graph of dihedral groups, semi-dihedral groups and quasi-dihedral groups are also determined.

Keywords: graph theory, non-commuting graph, dihedral group, semi-dihedral group, quasi-dihedral group