Maximum Degree Energy of The Commuting and Non-commuting Graphs Associated to The Dihedral Groups

Vian Salah[1;2], Nor Haniza Sarmin[1] and Hazzirah Izzati Mat Hassim[1]

[1]Department of Mathematical Sciences, Faculty of Science,
Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia
[2]Department of Mathematics, College of Education,Al- Mustansiriya University - Baghdad, Iraq Email: mohialdeen.v@graduate.utm.my, nhs@utm.my, hazzirah@utm.my

Abstract

The maximum degree energy EM(□) of a simple graph □ has been denned by Adiga and Smitha [2] as the summation of the absolute values of the maximum degree eigenvalues (the eigenvalues of the maximum degree matrix) of the graph □. In this research, the maximum degree energy of the commuting and non-commuting graphs associated to the dihedral groups of order 2n, D2n has been studied. In this paper, exact formulas of the characteristic polynomials, maximum degree eigenvalues and the maximum degree energy of the commuting and non-commuting graphs of D2n have been found. Furthermore, the relation between the maximum degree energy and the energy of these graphs has been obtained. Mathematics Subject Classification: 05C50

Keywords: Maximum degree energy, Commuting graph, Non-commuting graph.