**AAAG MONTHLY MEETING & MOCK VIVA**
**SEMESTER I, 2015/2016**

Date/Day : Tuesday, 27th October 2015
Time : 11:00 am – 1:00 pm
Venue : Main Meeting Room, Department of Mathematical Sciences, Faculty of Science (C22-310)

**TENTATIVE SCHEDULE**

| TIME | SPEAKERS |
|---|---|
| 11:00 – 11:30 am | Prof Dr Nor Haniza Sarmin<br>KAI AAAG 2015 |
| 11:30 – 12:00 pm | Norarida Abd Rhani<br>GENERALIZED COMMUTATIVITY DEGREE OF DIHEDRAL GROUPS AND THEIR GRAPHS<br>Supervisor: Dr Nor Muhainiah Mohd Ali<br>Co supervisors: Prof Dr Nor Haniza Sarmin and Prof Dr Ahmad Erfanian |
| 12:00 – 12.30 pm | Rosita Zainal<br>THE SCHUR MULTIPLIERS, NONABELIAN TENSOR SQUARES AND CAPABILITY OF SOME FINITE $p$-GROUPS<br>Supervisor: Dr Nor Muhainiah binti Mohd Ali<br>Co Supervisors: Prof Dr Nor Haniza Sarmin and Assist Prof Dr Samad Rashid |
| 12:30 – 1:00 pm | Lunch |

**Organized by**
**Applied Algebra and Analysis Group (AAAG),**
**Frontier Materials Research Alliance**
**Universiti Teknologi Malaysia, Johor Bahru, Johor**
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# ABSTRACT

**GENERALIZED COMMUTATIVITY DEGREE OF DIHEDRAL GROUPS AND THEIR GRAPHS**

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**Abstract**

Let $G$ be a dihedral group. The commutativity degree of a group $G$, denoted by $P(G)$, is the probability that two elements selected randomly from a group $G$, commute and it was firstly introduced by Miller in 1944. The aim of this research is to generalize the concept of commutativity degree of a group $G$ which is the multiplicative degree and subset normality degree. Furthermore this research will determined the properties of graph that associated to the subset normality degree of $G$. In this presentation, the research background, literature review, research methodology and the status of the research are presented.

**Keywords**: Commutativity degree, Dihedral Group, Graph Theory

# THE SCHUR MULTIPLIERS, NONABELIAN TENSOR SQUARES AND CAPABILITY OF SOME FINITE *p* GROUPS

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**Abstract**

The homological functors and nonabelian tensor product have its roots in algebraic K-theory as well as in homotopy theory. Two of the homological functors include the Schur multipliers and nonabelian tensor squares. The nonabelian tensor square is a special case of the nonabelian tensor product which involve the same groups. Meanwhile, a group is said to be capable if it is a central factor group. In this research, the Schur multiplier, nonabelian tensor square and capability for some groups of order $p^3$, $p^4$, $p^5$ and $p^6$ are computed. An algebraic computations of the center, derived subgroups, abelianization, Schur multipliers, nonabelian tensor squares and capability of the groups are determined with the assistance of Groups, Algorithms and Programming (GAP) software. By the use of the center, derived subgroups and abelianization, the Schur multiplier, nonabelian tensor square and capability for the groups are determined. The nonabelian tensor squares and capability are also determined using the results of the Schur multipliers. The Schur multiplier of the group is found to be trivial or abelian. The results show that the nonabelian tensor square of the groups are always abelian. A group is capable if and only if it has nontrivial kernel or an extra-special *p*-group with exponent *p*.

**Keywords:** homological functors, nonabelian tensor product, Schur multipliers, nonabelian tensor squares