

GAYSORN WATTANACHAIWANICH : NONPARAMETRIC TESTS FOR THE ANALYSIS  
OF RANDOMIZED COMPLETE BLOCK DESIGN. THESIS ADVISOR : ASSO. PROF.  
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The purpose of this research is to compare four statistics used for testing hypotheses about the treatment effects in randomized complete block design. They are parametric F test and three nonparametric tests namely, Friedman test, Quade test, Conover and Iman test. They are compared by determining power of the test when type I error could be controlled for all tests. The data were generated through simulation using the Monte Carlo technique. A computer program was designed to calculate the probability of type I error and the power of the test using all four statistics when the error term was normally distributed and using only three nonparametric tests for the case of logistic, double exponential, lognormal and scale contaminated normal distribution. Each situation was repeated 1,000 times.

The results are as follow :-

When the error term is normally distributed, the order power of the test shows subsequence : F test, Conover and Iman test, Quade test, Friedman test. However, mostly F test and three nonparametric tests give equal or nearly power of the test when the number of blocks are increased and the large difference of treatment effects. In the case of non-normal distribution, Conover and Iman test gives highest power of the test except for the case of lognormal distribution, mostly Friedman test has more power of the test than Conover and Iman test when the level of significance is 0.05 and the small difference of treatment effects.