MAYUREE JIRATANASOMBUT : A POWER COMPARISON BETWEEN PARAMETRIC AND NONPARAMETRIC IN ANALYSIS OF COVARIANCE OF COMPLETELY RANDOMIZED DESIGN. THESIS ADVISOR: SUPOL DURONGWATANA, Ph.D. 134 PP.

The purpose of this study is to compare the power of the test between parametric and nonparametric in analysis of covariance of completely randomized design with model $Y_{ij} = \mu + \beta(X_{ij} - \bar{X}..) + \tau_i + \varepsilon_{ij}$. It has been done though computer simulation. The probability of type I error between parametric method and nonparametric method. The error term (ε_{ij}) in the model were generated as both normal and non-normal distribution. The non-normal distribution used in the study were logistic and double exponential distribution. The number of treatments were of 3, 4 and 5 treatments in both equal and unequal spacing of the covariate X. The coefficient of variation were simulated as 5%, 10% and 15%. The sample size were 5, 15, 30 and 50 respectively. The results of this are concluded as follow :

1. When the number of treatments are 3 and 4 and the distribution of error term are normal and logistic distribution, the parametric method is better than nonparametric method. The probability of type I error are equally controllable when the error term in the model is double-exponentially distributed. In the case of 5 treatments and normal-distributed error, the parametric method can control the probability of type I error better than the one from the nonparametric. The nonparametric method is better than the parametric method when the error term is logistic and double exponential distributions.

2. If the number of tratments are 3, 4 and 5 while the error distribution is logistic and double exponential and the sample size is very small, the nonparametric method is more powerful than the parametric one. Having increased the sample size and the coefficient of variation, the former remains having more power. Moreover, the small difference of treatment effects in the model does influence the result mentioned. Finally, when the error term is normal distribution, the parametric method is more powerful than the nonparametric method in all of sample size except for the case of extremly small sample size (size = 5).