QUAID-I-AZAM UNIVERSITY

DEPARTMENT OF STATISTICS

SAMPLE PAPER FOR PH.D. STATISTICS ADMISSION TEST

Q.1(a) Define the Latin square design and construct it for .

 (b) Consider a fractional factorial design. To run the design we have two choices: one with the highest order interactions as the design generator and the other with highest possible resolution, which one you will be preferred? Give your comments.

Q.2(a) What are the assumptions underlying the methods of least squares? Why we prefer to use the coefficient of determination?

 (b) Write down different procedures for removing the hetroscedasticity problem. Describe two of them briefly.

 Q.3(a) Find MLE’s of the parameters of the normal distribution when both are unknown.

 (b) Let *X* have a Bernoulli distribution with parameter. For a random sample of size 10, find the most powerful test of size for versus .

Q.4(a) A foreign student club lists as its members, 2 Canadians, 3 Japanese, 5 Italians, and 2 Germans. If a committee of 4 is selected at random, find the probability that (i) all nationalities and (ii) all nationalities except the Italians are represented.

 (b) Suppose that *X* and *Y* has joint probability density function



1. Determine the value of *k* which makes this a probability density function.
2. Are *X* and *Y* independent?

Q.5(a) Describe the finite population correction (*fpc*) term. Why we use it?

 (b) Describe the stratified random sampling. How we can estimate the population parameters under this sampling scheme.