CHAPTER VIII

CONCLUSIONS

The detailed review of past literature on estimation techniques and its classification will serve as a ready reference to a control engineer dealing with estimation problems.

It is shown that the estimation problem as a two point boundary value problem can be solved by steepest descent technique. It is demonstrated that the estimation technique proves to be successful in estimating the parameters of transfer functions of a turbo-alternator from normal operating data. It has been observed that the method works very well for any type of first order system considering only the additive noise with the output. It is not designed to take care of dynamic noise. However, it is shown that the effect of dynamic noise, if any, can be overcome by digital filtering. The estimation of the second order plant virtually failed to give any results on account of convergence problems. It has been observed that with different types of second order systems, the convergence behaviour of parameters had been different. The estimation of third order closed-loop plant gave satisfactory results. However, no assurance regarding convergence can be given for any type of third order system, in general. The convergence troubles posed by plateau and uniqueness problems are overcome by devising a suitable computational algorithm.

It is also shown that the sequential scheme of estimation fails to work when the variance of noise is large compared to parameters. The nonsequential scheme overcomes this difficulty and gives reliable estimates though the computer time may be comparatively more.

of parameters for the second order plant could be explained by studying the locus of its roots, as the parameters change on every iteration.

It is also thought that the convergence problems posed by higher order systems in seeking the minima by steepest descent technique could be overcome by the method suggested by Noton, et. al.[107] wherein the two point boundary value problem is avoided altogether. In fact, the method is only slightly different from the Merriam's[108] method of second variations.