Scope for Further Research

In this thesis, we studied periodic random error and periodical burst error -detecting and -correcting codes without and with weight constraint. The necessary and sufficient number of parity check digits required to construct such linear codes are presented. Hamming weight distribution of the error patterns, Plotkin's types of bound and the probability of decoding error of the codes are also derived. Finally periodical burst detection/correction of any linear code and the code C_b are also investigated along with a decoding method of C_b in the case of periodical burst error. We illustrate the results with the help of examples. We also examine the efficiency of the codes in terms of parity check digits. Using this information, we can determine which code to use under what situations. The following problems may be examined for further research:

(a) Asymptotic form of the necessary and sufficient conditions for the codes discussed in this thesis can be explored.

(b) Cyclic codes correcting periodic random and periodical burst error can be studied.

(c) Optimum codes which correct only the above mentioned error pattern and no others can be interesting to explore.

(d) Other types of bounds like Johnson bound [42], Elias bound [26] and Griesmer bound [34] with respect to burst-b distance can be investigated.

(e) MacWilliam type of weight distribution [49] in terms of burst-b weight for any linear code can be studied.

(f) Burst-b weight distribution of the dual code $C_b^{\perp}$ of C_b can also be studied.

(g) The burst-b weight distribution, given by Ezerman et al. [27], of any linear code and the MDS code C_b, can also be studied.