CHAPTER VI
CONCLUSIONS AND FUTURE WORKS

This thesis investigates two numerical methods; BEM and meshless method. Both methods are described in solving two dimensional Laplace equation having two boundary conditions; Dirichlet and mixed boundary conditions. The first method, BEM requires elements for solving the problems whereas the second method does not require, but nodes within domain and boundary domain are only defined. This study, we focus on radial basis function collocation method which is ones of meshless methods. The MATLAB program was utilized in solving problems. Results of BEM and MLM1 were compared with the analytical solution, which considered only accuracy of both methods. Results of all problems obtained from both methods are satisfactory. It also can be seen that those of MLM1 are more accurate than those of BEM. In addition, it is interesting to consider comparison of results obtained from MLM1 and MLM2 with the same shape parameter. Results of both methods are similar. However, it can be seen that errors of MLM1 are slightly smaller than those of MLM2. Furthermore, it is found that there is a variance of accuracy obtained from both methods that is uncertain to shape parameter. Nevertheless, we can obtain the solutions of high accuracy if appropriate values of shape parameters are chosen.

Results of BEM and MLM1 indicate that MLM1 is slightly capable of solving problems better than BEM when dealing with more complex problems. This thesis has shown that meshless method has the potential to be an acceptable alternative numerical method in solving Laplace equation in terms of accuracy.

Future work should investigate condition number of the matrices equation, solve the nonlinear partial differential equations, or use two methods in solving complex domains and other ideas of choosing nodes within domain and boundary domain.