CHAPTER 8
CONCLUSION AND FUTURE SCOPE

The main contribution of this research thesis entitled “Metaheuristic based Multi Objective Task Scheduling for Managing the Cost in Cloud Computing Environment” is to investigate and focus on meta-heuristic methods such as Genetic Algorithms (GA), Ant Colony Optimization (ACO) and Particle Swarm Optimization (PSO) for solving the task scheduling problem in cloud computing environment.

A mathematical model was designed to compute the total cost of task assignment. The problem is modeled based on execution cost, migration cost, operational cost, down time cost and communication cost. Since the problem is NP-Hard meta-heuristic approaches were considered. GA, ACO and PSO algorithms were designed separately to solve the task scheduling problem. Emphasis is made on PSO to explore the possible use of various algorithms such as Standard PSO, Synchronous PSO and Asynchronous PSO.

Research observations are made through simulation of cloud computing environment. The results obtained with PSO are compared with GA, ACO, Standard PSO, and Synchronous PSO. Experimental results show that PSO based task scheduler yielding for 10-20% better performance when compared to Genetic and Ant Colony Optimization algorithms. It also observed that the tasks are tightly aggregated on to minimum number of resources and subsequently leading to better resource utilization and minimum energy consumption.

Among the PSO algorithms, Asynchronous PSO provides better results compared to synchronous and standard PSO. It was observed that Asynchronous PSO Provides 15-20% better results over Standard PSO, Synchronous PSO.

Future developments of this work are related further improve our mathematical model by adding more Quality of Service parameters. In the future, we plan to further improve our algorithms to re-allocate resources according to requirement or to the existing status of the Cloud in order to optimize resource usage. One more important aspect treated in resource collection and optimization challenges is the question about energy management.