UVA WELLASSA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY

END SEMESTER EXAMINATION – JUNE/JULY– 2010

CST309-2 DISTRIBUTED AND PARALLEL COMPUTING

Time Allowed: **Two hours**

Answer all five Questions. And attach your question paper to the answer script

Q1.

i. What is parallel computation? Give three examples. (6 marks)

ii. Explain performance limits of parallel programs. (3 marks)

iii. Explain about the memory distribution of a parallel system. (3 marks)

iv. Give two examples for the following memory types.

a. Distributed Memory

b. Shared Memory

c. Hybrid (SMP Cluster)

d. Middleware and Network Operating System (NOS) (8 marks)

Q2.

a) Compare the following parallel architectures. Describe two unique features of each of them that cannot be found in any of the other architectures.

i. Parallel vector processor (PVP)
ii. Symmetric multiprocessor (SMP)

iii. Massively parallel processor (MPP)

iv. Cluster of workstations (COW)

v. Distributed shared machine (DSM) (10 marks)

b) Five different real-life parallel architectures and applications models are given below. Explain how they differ, and what are their strengths and weaknesses.

i. PRAM

ii. EREW-PRAM

iii. CREW- PRAM

iv. CRCW-PRAM

v. VLSI (10 marks)

Q3.

i. Explain the use of cryptography.

ii. Describe classes of cryptographic algorithms.

iii. Write the algorithm for Dense Matrix-Matrix multiplications.

iv. Write the algorithm for Dense Matrix-Vector multiplications.

(20 marks)

Q4. Describe the followings with an example for each.

i. Secret communication with a shared secret key

ii. Authenticated communication with public keys

iii. Digital signatures with a secure digest function

iv. Cryptographic Algorithms

v. Symmetric key and Asymmetric

(20 marks)

Q5.

a) Prove Gustafson's law and Amdahl's law. (6 marks)

b) Explain the file service architecture of a distributed system. (3 marks)

c) What is the Secure Socket Layer (SSL)? (3 marks)

d) Draw the following architectures.

i. Embedding p=32hypercube in to 2-D mesh

ii. Typical Network File System (NFS) architecture

iii. Distribution of processes in the Andrew File System

iv. Parallel Processor Layout of Shared Memory and the Distributed Memory

(8 marks)