UVA WELLASSA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY

END SEMESTER EXAMINATION – AUG/SEP– 2011

CST309-2 DISTRIBUTED AND PARALLEL COMPUTING & REPEAT

Time Allowed: **Two hours** Answer all four questions. And attach your question paper to the answer script

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Q1.

i. What is the difference between parallel computing and distributing computing? (6 marks)

ii. Explain performance limits of parallel programs. (4 marks)

iii. What is parallel computing used for? What industries use it and to solve what kind of problems? (4 marks)

iv. Explain about the memory distribution of a parallel system. (4 marks)

v. Give two advantages and disadvantages of using the following memory types.
   a. Distributed Memory
   b. Shared Memory
   c. Hybrid (SMP Cluster) (12 marks)

Q2.

a) Describe following 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) Explain about the process of following five different real-life parallel architectures and application models.

i. PRAM

ii. EREW

iii. CREW

iv. CRCW

v. VLSI (10 marks)

Q3. For the task graphs shown in the picture, find out the following

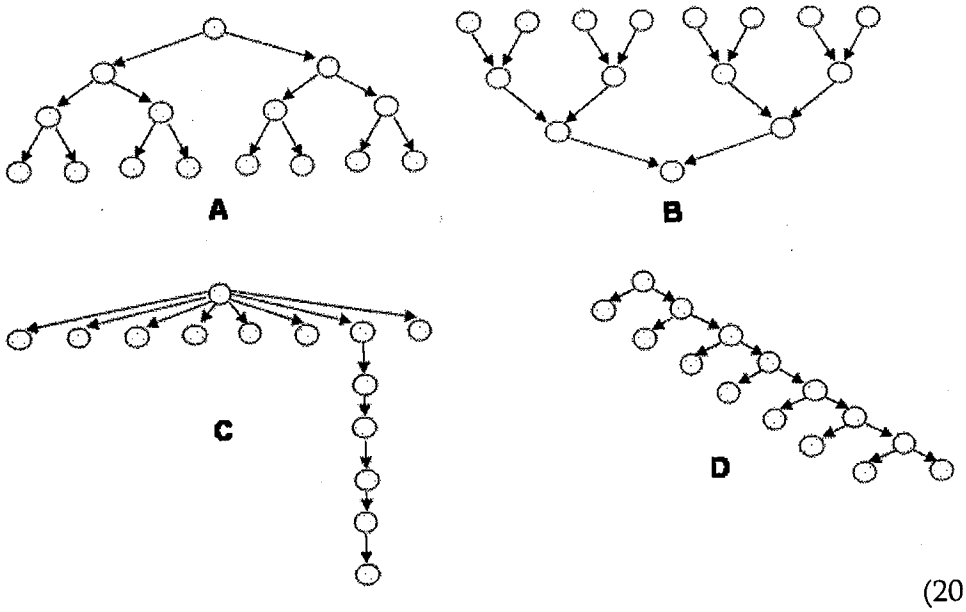
a) Maximum degree of concurrency.

b) Critical path length.

c) Maximum achievable speedup over one process assuming that an arbitrarily large number of processes are available.

d) The minimum number of processes needed to obtain maximum speed up.

e) The maximum speed up if the number of processes is limited to (a) 2, (b) 4, (c) 8.



(20 marks)

Q4.

a) Prove Gustafson's law and Amdahl's law. (8 marks)

b) Explain the file service architecture of a distributed system. (4 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

v. Typical SIMD architecture and MIMD architecture

(15 marks)