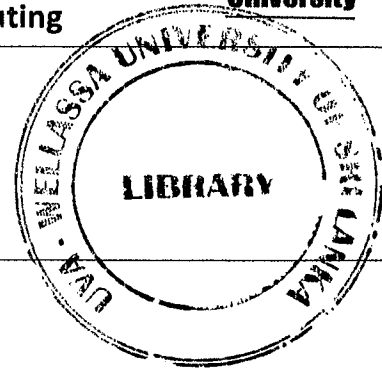


**Uva Wellassa University of Sri Lanka**  
**Faculty of Science and Technology**  
**Department of Computer Science and Technology**  
**300 level 2<sup>nd</sup> Semester Examination – Sept. / Oct. 2015**  
**CST 326-2 Distributed and Parallel Computing**



**Instructions to candidates**

**Duration: Two (02) hours**

**Number of questions: five (05) Essay questions**

**Answers four(4) questions only**

**Mark allocation: 100 (All questions carry equal mark)**

1.
  - a. Describe **Parallel Computing** with aid of a real world example. (4 mark)
  - b. Draw the **Flynn Matrix (Flynn Taxonomy)** diagram and explain any two model in it. (5 mark)
  - c. Give **three(03)** areas of Science and Engineering that uses parallel computing to model the difficult problem. (3 mark)
  - d. Describe the significant differences of **Uniform Memory Access (UMA)** and **Non Uniform Memory Access (NUMA)**. (5 mark)
  - e. Describe the pros and cons of **Distributed Memory**. (5 mark)
  - f. Briefly describe **Hybrid Memory** architecture using a simple diagram. (3 mark)
  
2.
  - a. Describe clearly all the steps of **Parallel Algorithm** designing. (5 mark)
  - b. Find the differences between **synchronous** and **asynchronous** parallel algorithms. (4 mark)
  - c. Briefly describe any **two (02)** decomposition techniques of **Parallel Algorithm**. (4 mark)
  - d. Consider a task finding the average of given set of elements.
    - i. Write an sequential algorithm to find the average.
    - ii. Write a parallel algorthim to find the average.
    - iii. Compare the complexity and performance of sequential and parallel algorithm written for above questions ( i and ii). (12 mark)

- 3.
- a. List all the classification of interconnection network. (4 mark)
  - b. Describe the use of interconnection network topology. (4 mark)
  - c. Explain what is meant by Completely Connected Network (CCN). (4 mark)
  - d. Give any **three (03)** Limited Connected Network (LCN) patterns. (4 mark)
  - e. Construct a 16 node 3D Mesh Interconnection Network (4 mark)
  - f.
    - i. What is a Hypercube interconnection network?
    - ii. Construct a 4D hypercube interconnection network. (5 mark)
- 4.
- a. Explain how **Distributed System** differs from the **Centralized System**. (5 mark)
  - b. Give **four (04)** examples for **Distributed System**. (4 mark)
  - c. Describe what is reliable communication? (3 mark)
  - d. Describe about Automatic Teller Machine(ATM) Network in Distributed System context. (4 mark)
  - e. Give **five (05)** common characteristics of Distributed System and describe **three (03)** of them. (4 mark)
  - f. Give **four (04)** different types of transparency and describe **two (02)** of them. (5 mark)
- 5.
- a. Describe the role of names and name services. (5 mark)
  - b. Describe how Domain Name System (DNS) works. (3 mark)
  - c. Give any **three (03)** requirements for name spaces. (6 mark)
  - g. Briefly describe about Directory and Discovery services. (4 mark)
  - d. Describe how caching helps to a name service's availability. (7 mark)