

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
300 level 2nd Semester Examination – Dec.2018/Jan.2019
CST342-3 Parallel and Distributed Computing



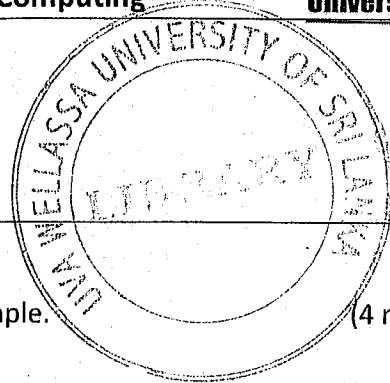
Instructions to candidates

Duration: Two (02) hours

Number of questions: Four (04)

Answer all questions

Mark allocation: 100



1.
 - a. Describe Parallel Computing using a real world example. (4 mark)
 - b. Describe two (02) limitations of serial computing. (6 mark)
 - c. Give four (04) areas of science and Engineering that uses parallel computing to model the difficult problem. (4 mark)
 - d. Describe the significant differences of Uniform Memory Access (UMA) and Non Uniform Memory Access (NUMA). (6 mark)
 - e. Briefly describe Single Instruction Multiple Data (SIMD) architecture with the aid of an example. (5 mark)

2.
 - a. List all the classification of interconnection network. (4 mark)
 - b. Describe the use of interconnection network topology. (4 mark)
 - c. Draw any three (03) Completely Connected Network (CCN) topologies. (6 mark)
 - d. Describe the properties of Hypercube network topology. (5 mark)
 - e. Evaluate **Crossbar, Omega and Tree Network** using **Bisection width, Cost and Diameter** (6 mark)

3.
 - a. What is meant by Startup time (t_s) in communication cost? (3 mark)
 - b. Describe how to find the total communication cost for a message of size m words to traverse l communication links using the **store and forward** method. (5 mark)
 - c. List three(03) types of communication mechanism in Message Passing Interface (MPI) (5 mark)

- d. Explain the **one-to-all** broadcast on an **eight-node** (0 to 7) ring topology (assume Node 0 as source). (6 mark)
- e. Explain **all-to-all** broadcast on a Hypercube with the aid of diagrams. (6 mark)
- 4.
- a. Explain how Distributed System differs from the Centralized system. (5 mark)
- b. Give five (05) examples for Distributed System. (5 mark)
- c. Describe advantages and disadvantages of Time Sharing System. (3 mark)
- d. Describe about a Home Automation System in Distributed System context. (6 mark)
- e. Describe the Workstation-server Model in a Distributed System. (6 mark)

