University of Ruhuna - Faculty of Technology
Bachelor of Information and Communication Technology Degree
Level 3 (Semester 2) Examination, August 2020

Course Unit: ICT3253- Distributed and Cloud Computing   Time Allowed: **2 hours**

Answer all **four (04)** questions

This question paper contains **03 pages**. Each question carries **25 marks**.

Question 01

a) "Distributed System", what do you understand by this term?

b) Does Distributed Computing different from Centralized Computing and Parallel Computing? Justify your answer.

c) Highlight the main System Models available in Distributed Computing?

d) Briefly discuss Synchronous and Asynchronous Communication. Which one is the preferred mechanism for communicating with the telephone? Why?

e) "A distributed system that is able to present itself to user and application as if it were only a single computer system is said to be transparent"

   i. State four types of transparencies in a distributed system.

   ii. Briefly discuss how transparencies help to build a secure and reliable distributed system, using two types of transparencies which mentioned in part (ii).

Question 02

a) Deadlock is a fundamental problem in distributed computing. What are the strategies can be used to handle deadlock in distributed computing?

b) "Service-Oriented Architecture (SOA) uses interfaces which solves the difficult integration problems in large systems." Justify this statement by highlighting benefits and challenges of SOA.

c) "A Remote Procedure Call (RPC) is an inter process communication technique that is used for client-server based applications."

    i. Draw a suitable figure to explain RPC Operations.

    ii. What are the differences between Client Stub and Server Stub?

d) Interest in Web services is rapidly increased from their start of use. To exchange information among the application in standard way is the main goal of web services.

    i. "Simple Object Access Protocol (SOAP) enables client applications to easily connect to remote services and invoke remote methods." Do you agree with this statement? Justify your answer.

    ii. Illustrate and briefly explain SOAP message structure.

    iii. Discuss the strengths and weaknesses of SOAP.

Question 03

a) REST is an architectural style for providing standards between computer systems on the web to communicate with each other. Briefly describe why REST architecture becomes popular.

b) Draw a suitable figure and explain major components of HTTP Request.

c) "A distributed database is a collection of multiple interconnected databases, which are spread physically across various locations that communicate via a computer network"

    i.   Highlight four major Distributed database setup methodologies.

    ii.   Suppose you have to setup a Distributed database system for your client. Discuss, how you choose a suitable method to setup a distributed database system.

d) "It is not easy to design a secure distributed system due to security issues". Justify this statement with regarding to current security issues. Discuss, how can you solve this security issues using proper security mechanisms?

Question 04

a) Discuss why cloud computing has become an important tool and why so many businesses moving to the cloud today?

b) Briefly explain each of the following service models with an example
    i.   SaaS
    ii.   PaaS
    iii.   IaaS

c) Briefly explain an advantage and a disadvantage of using cloud based data center services.

d) Distinguish between Server Virtualization and Storage Virtualization.

e) Briefly explain unique characteristics of an ideal Cloud Computing model.

f) Suppose you have been appointed as a project manager and assigned the task of developing a POS (Point of Sale) system for a leading supermarket. They have few branches and need to expand their branches without taking any risk of damaging the daily operations of the supermarkets. Do you agree that moving the servers to a cloud is a better solution than purchasing additional servers? Justify your answer.

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