"Investing in Africa's Future"

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCSC 305 PARALLEL AND DISTRIBUTED COMPUTING

END OF FIRST SEMESTER EXAMINATION

NOVEMBER 2021

LECTURER: MR O MAGWAGWA

TIME: 5 HOURS

INSTRUCTIONS

1. Answer any one question.
2. Compile your answer into one consolidated PDF format document.

QUESTION 1

As an object-oriented programmer, you have been tasked to create a banking system that will be used at various branches across Zimbabwe. Using your knowledge of distributed-object Computing tools write a report to your line manager informing them of the following:

a) Concept of distributed computing and how to benefit with such technologies **[25 Marks]**
b) Discuss the major software development process in high performance computing in parallel and distributed environments **[25 Marks]**
c) Generate an in-depth analysis of the technologies you will use for objects located in remote locations **[25 Marks]**
d) Summarise the programming languages that have the capabilities to support remote object-oriented programming. **[25 Marks]**

QUESTION 2

'Concurrency is a challenge that needs to be controlled in a multi process and multi thread environment'.

Develop a concept note that either supports or rejects the statement taking into consideration parallel and distributed computing. The concept note should include the following

a) An in-depth analysis of how threads and processes work. **[20 Marks]**
b) Discuss how they differ in the way they are controlled. **[20 Marks]**
c) Discuss how processes and threads are affected by distributed shared memory environment **[20 Marks]**
d) Discuss the two broad categories of fault tolerance techniques. **[20 Marks]**
e) Discuss how the message passing tools contribute to the statement. **[20 Marks]**

QUESTION 3

You have been appointed the System administrator to a local company in Mutare which is meant to provide processing efficiency to their client's data at cite. Develop a case application how you will be setting up infrastructure to enable them to get operational efficiencies and take into consideration the following in your response

a) Project definition **[5 Marks]**

b) Protocols and technology, you will use **[15 Marks]**

c) Distributed and parallel computing models available and **[20 Marks]**

d) Architecture that could be used **[20 Marks]**

e) The benefits of distributed database **[20 Marks]**

f) Possible challenges of distributed **[20 Marks]**

END OF EXAMINATION