AFRICA UNIVERSITY
A United Methodist-Related Institution

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

CSC 211 OPERATING SYSTEMS

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2018

LECTURER: MR A.C MUZENDA

DURATION: 3 HOURS

INSTRUCTIONS

Answer all Questions in Section A and **any three questions from Section B**
Total possible mark is 100

Start **each** question on a new page in your answer Booklet.

The marks allocated to **each** question are shown at the end of the section.

SECTION A

Answer all questions

QUESTION 1

a. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems? [8]

b. Briefly outline the goals of the Memory management unit in an operating system. [6]

c. Can a system detect that some of its processes are starving? If you answer "yes," explain how it can. If you answer "no," explain how the system can deal with the starvation problem. [4]

d. Explain what cache memory is? When are caches useful? What problems do they cause and solve? [8]

e. Compare and contrast multiprocessing and multiprogramming. **[4]**

f. State and explain the advantages and disadvantages of using open source software. **[6]**

g. Explain the structural characteristics of a monolithic operating system. **[4]**

SECTION B

Answer any three questions

QUESTION 2

a. Explain the purpose of the Banker's algorithm and how it works with the aid of an example. [10]

b. What is thrashing? When does it occur? Explain. **[4]**

c. Compare and contrast a thread and a process. **[6]**

QUESTION 3

a. State and explain any five functions of an operating system. **[10]**

b. Compare and contrast multiprocessing and multiprogramming. **[4]**

c. State three advantages and disadvantages of placing functionality in a device controller, rather than in the kernel. [6]

QUESTION 4

a. Discuss how an operating system handles an interrupt. [8]

b. Explain what is a thread? List two advantages do threads have over multiple processes. What major disadvantage do they have? Suggest one application that would benefit from the use of threads, and one that would not. [7]

c. Give any five functions of an operating system. [5]

QUESTION 5

a. Deadlock can be prevented by negating any one or more of the four necessary and sufficient conditions. List the four necessary conditions and briefly describe the consequences of negating them. **[12]**

b. Discuss giving examples, the need for system protection. [8]

QUESTION 6

a. With the aid of a diagram, give a detailed description of the five state process models, fully explaining all the transitions that lead to each state. **[14]**

b. With the aid of an example, explain the following scheduling algorithm.

i. Round Robin Scheduling **[6]**

THE END