LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

SECOND YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN (ICT)

BICT 223: PLATFORM TECHNOLOGIES I

STREAM: R ***TIME: 2 HRS***

DAY: FRIDAY [11.30AM – 1.30 PM] ***DATE: 12/04/2024***

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS TO CANDIDATES

SECTION A: (Compulsory) TOTAL MARKS FOR THIS SECTION IS 30.

QUESTION ONE: (30 MARKS)

a) Explain the following terms as used in operating systems:

i. Platform **(2 Marks)**
ii. System call **(2 Marks)**
iii. Kernel **(2 Marks)**
iv. Algorithm **(2 Marks)**
v. Interrupt **(2 Marks)**

b) Outline **THREE** benefits of platform technologies **(3 Marks)**

c) Distinguish between internal and external fragmentation **(4 Marks)**

d) Highlight **FIVE** types of system calls **(5 Marks)**

e) Assuming you have been tasked to design a job scheduling algorithm for a proposed operating system. Explain **THREE** features that you would consider in your design **(6 Marks)**

f) Describe the thread/process model in operating system **(2 Marks)**

SECTION B. TOTAL MARKS FOR THIS SECTION IS 40.

ANSWER ANY TWO QUESTIONS FROM THIS SECTION. EACH QUESTION IN THIS SECTION CARRIES 20 MARKS.

QUESTION TWO: (20 MARKS)

a) A typical operating system is bound to be upgraded over a number of reasons.

i. Explain the term operating system **(2 Marks)**

ii. Discuss **FOUR** reasons that could influence the need to upgrade operating system **(8 Marks)**

b) Identify **FOUR** advantages of kernel loadable modules **(4 Marks)**

c) Describe **THREE** file access methods **(6 Marks)**

QUESTION THREE: (20 MARKS)

a) i. System calls are very critical in supplying services between the operating system and the hardware. With the help of a diagram, describe how a system call works **(6 Marks)**

ii. Highlight **FIVE** services that are provided by a system call **(5 Marks)**

iii. List **THREE** examples of system calls **(3 Marks)**

b) Explain the top half and bottom half interrupt handlers **(6 Marks)**

QUESTION FOUR: (20 MARKS)

a) i) Explain the term process scheduler **(2 Marks)**

ii) Outline **FOUR** features of a good process scheduler **(4 Marks)**

b) Citing an example in each case, discuss any **FIVE** process management scheduling algorithms **(10 Marks)**

c) Explain **TWO** circumstances under which a pre-emptive scheduling decision would be made by the operating system during the inter-process communication **(4 Marks)**

QUESTION FIVE: (20 MARKS)

a) Context Switching is a feature in the multitasking operating system that allows sharing of a single CPU with many processes. This is effectively done with the help of triggers. Explain **THREE** main triggers that are commonly used in the context switching **(6 Marks)**

b) Explain **THREE** file allocation strategies **(6 Marks)**

c) Describe **FOUR** memory management techniques **(8 Marks)**